

BCGA GUIDANCE NOTE GN 3

Safe Cylinder Handling and the Application of the Manual Handling Operations Regulations to Gas Cylinders

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British Compressed Gases Association

PREFACE

BCGA was established in 1971, formed out of the British Acetylene Association, which existed since 1901. BCGA members include gas producers, suppliers of gas handling equipment and users operating in the compressed gas field.

The main objectives of the Association are to further technology, to enhance safe practice, and to prioritise environmental protection in the supply and use of industrial gases, and we produce a host of publications to this end. BCGA also provides advice and makes representations on behalf of its Members to regulatory bodies, including the UK Government.

Policy is determined by a Council elected from Member Companies, with detailed technical studies being undertaken by a Technical Committee and its specialist Sub-Committees appointed for this purpose.

BCGA makes strenuous efforts to ensure the accuracy and current relevance of its publications, which are intended for use by technically competent persons. However this does not remove the need for technical and managerial judgement in practical situations. Nor do they confer any immunity or exemption from relevant legal requirements, including by-laws.

For the assistance of users, references are given, either in the text or Appendices, to publications such as British, European and International Standards and Codes of Practice, and current legislation that may be applicable but no representation or warranty can be given that these references are complete or current.

BCGA publications are reviewed, and revised if necessary, at five-yearly intervals, or sooner where the need is recognised. Readers are advised to check the Association's website to ensure that the copy in their possession is the current version.

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* Numbers in brackets refer to references in Section 7. Documents referenced are the edition current at the time of publication of this Guidance Note.

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Safe Cylinder Handling and the Application of the Manual Handling Operations Regulations to Gas Cylinders

1 INTRODUCTION

This Guidance Note provides a short summary of the duties of employers and employees under the Manual Handling Operations Regulations 1992, SI 1992 No. 2793, (1) as amended by the Health and Safety (Miscellaneous Amendments) Regulations 2002, SI 2002 No. 2174 (2) with regard to the handling of gas cylinders by users.

Note: HSE revised its Guidance on The Manual Handling Operations Regulations 1992 (as amended) in 2004 - see L23 (3). Additional information can also be found in the HSE Research Report 228 - Review of the risks associated with pushing and pulling heavy loads (5).

Musculoskeletal Disorders

Musculoskeletal disorders (MSDs) are the most common occupational illness in Great Britain; affecting 1.1 million people a year. In 1995/96, MSDs cost society £5.7 billion (1995/96 prices). MSDs affect muscles, joints, tendons and other parts of the musculoskeletal system.

Risk factors causing MSDs can be found in virtually every workplace and an estimated 12.3 million working days a year are lost to work-related MSDs.

Risk factors that can contribute to the onset of some types of MSD include

- Repetitive and heavy lifting
- Bending and twisting
- Repeating an action too frequently
- Uncomfortable working position
- Exerting too much force
- Working too long without breaks
- Adverse working environment (e.g. hot, cold)

When a number of such risk factors are present, the risk is usually greater.

Gas cylinders are difficult objects to move safely. Large cylinders may weigh upwards of 100kg. They are tall and thin and can quite easily be toppled over. This Guidance Note has been prepared by producers and distributors of compressed, dissolved and liquefied cylinder gases and cylinder manufacturers for the benefit of all users.

The purpose of this guidance is

1. to provide a basis for good practice when handling and moving cylinders
2. to provide a basic understanding of the Manual Handling Operations Regulations (1) as relating to gas cylinders
3. to give specific guidance to those involved in handling cylinders and their managers.

The Manual Handling Operations Regulations (1) were introduced predominantly to reduce the number and severity of back and other injuries such as those to hands, arms and feet suffered in industry as a result of manual handling operations by

- avoiding the need for potentially hazardous manual handling, so far as is reasonably practicable
- identifying potential hazards through structured assessment
- subsequent risk reduction.

2 SCOPE AND LIMITATIONS OF THIS GUIDANCE NOTE

2.1 Scope

To define the principles of safe practice for users on the handling of compressed, dissolved and liquefied gas cylinders at work places within the limitations given below.

2.2 Limitations

This Guidance Note does not apply to Liquid Petroleum Gas (LPG) Cylinders – for information on handling them refer to UKLPG (formerly the LP Gas Association) or the gas supplier.

Although this Guidance Note encourages the use of lift trucks and other mechanical handling aids, it does not incorporate specific guidance on their use or maintenance, which should be obtained from the equipment manufacturers.

Although increased mechanisation such as palletisation and the use of fork lift trucks has dramatically reduced some types of cylinder handling incidents, it has introduced into work areas the potential for serious injury associated with the handling equipment itself. Risk assessments should consider the risks associated with the use of mechanical lifting aids. (Refer to Provision and Use of Work Equipment Regulations (S.I. 1992 No. 2932) and Lifting Operations and Lifting Equipment Regulations (S.I. 1998 No. 2307)).

3 EMPLOYER / EMPLOYEE DUTIES

3.1 Employers' Duties

The Regulations require employers to address a number of key points. They should

- 3.1.1 Avoid manual handling by provision of hoists, lift trucks, trolleys, etc, if appropriate to the application
- 3.1.2 List manual handling activities and consult employees or safety representatives
- 3.1.3 Carry out suitable and sufficient assessments as illustrated in Section 5 and Appendices 1 and 2 on those activities that present significant risk, e.g. loading cylinders on to customer vehicles and manual stacking of cylinders.
- 3.1.4 Review and prepare assessment and ensure that there is a system in place to update the assessment when the task or load changes
- 3.1.5 Reduce the risk of injury by developing measures to controlling the risks identified in the assessments such as:
- reduction of manual handling operations
 - introduction of lifting devices and mechanical aids
 - reducing handling distances, e.g. from storage to loading point
 - considering the use of pallets if practical
 - review ergonomics, i.e. reduce the amount of twisting and stretching
 - designing, constructing and maintaining working areas to a high standard to eliminate defects.
- 3.1.6 Provide information and training for employees who are involved in cylinder handling (see Section 6) e.g.
- by reference to the product safety data sheet and information on the weights of the cylinders
 - any need for protective clothing / equipment
 - the importance of level handling surfaces
 - the safe use of lifting devices
 - specific manual handling techniques
 - the need to secure cylinders after handling by means of straps or securing chains.
- 3.1.7 For customers it is recommended that safety data sheets or other relevant information be provided to comply with the requirement to give information on the weight and characteristics of the cylinders, see Section 6 of the Health and Safety at Work Act, and the Chemicals (Hazard Information and Packaging for Supply) Regulations (S.I. 2002 No 1689).

3.2 Employee's Duties

Employees have duties under Regulation 5 of the Manual Handling Operations Regulations (1) to operate a safe system of work. They should therefore:

- 3.2.1 use equipment or follow the system of work as trained
- 3.2.2 inform their employer of any physical condition, restriction or incapacity (including pregnancy)
- 3.2.3 co-operate with employer in reporting of defects and participate in safety training
- 3.2.4 use personal protective equipment as specified.

4 POTENTIAL MANUAL HANDLING HAZARDS & ASSOCIATED CONTROL MEASURES

4.1 Background

Gases supplied in cylinders are in compressed, dissolved or liquefied form. The cylinders vary in weight, size and shape. These variations can give rise to potential handling hazards, a number of which are listed in this section together with some basic control measures.

Some general control measures should be implemented when moving and handling cylinders.

- Always wear protective footwear and gloves that are in good condition. Where possible, and certainly for regular cylinder handling operations, footwear should incorporate metatarsal protection.
- Always secure vertical cylinders unless they are under the operator's direct control. **Never turn your back on a freestanding cylinder.**
- When standing or moving cylinders, be aware of the hazards of uneven, sloping, slippery and vibrating surfaces as well as loose debris.
- **DO NOT ATTEMPT TO CATCH A FALLING CYLINDER – GET OUT OF THE WAY!**

Forklift trucks are often used to carry cylinders secured in pallets. Your cylinder supplier may be able to provide pallets to facilitate the movement of cylinders from storage to the point of use. See Section 4.11.

For hoisting, either a purpose-made cradle or a twin-rope sling or bandage sling should be used. **Magnet hoists, single ropes or chain slings must not be used.**

- **ALWAYS** check that cylinders in pallets and storage cages are stable and straighten any leaning cylinders before releasing the restraining strap or chain – and **ALWAYS GET HELP TO DO THIS.**

4.2 Cylinder Weight

The weight of a cylinder depends on its capacity, construction and the weight of product contained. Large cylinders in general are very heavy. The majority of them are in the 60-110kg range.

The weight of cylinders can be obtained from the gas supplier. It is important to distinguish between full and nominally empty cylinders containing liquefied gases - full or partially full liquefied gas cylinders behave differently from empty ones when being moved. This is due to the movement of the liquid inside the cylinder.

Work instructions should provide information on the weight of cylinders to be handled and the methods of distinguishing between full and nominally empty cylinders containing liquefied gases.

4.3 Cylinder Size/Shape

Cylinders of various heights and diameters are used. High pressure compressed gas cylinders have a large height to diameter ratio and high centre of gravity which may render them unstable on ground that is not level. On unsuitable or uneven surfaces freestanding cylinders may topple over causing adjacent cylinders to topple. Cylinder handlers can be at risk if they try to prevent an unstable cylinder falling over or lifting a fallen cylinder to restore it to the vertical.

DO NOT ATTEMPT TO STOP A FALLING CYLINDER – GET OUT OF THE WAY!

The majority of liquefied gas cylinders have a larger base diameter and are relatively stable. Handlers should, however, be aware that when moving liquefied gas cylinders from the vertical position the centre of gravity will alter and may affect the stability of the cylinder, see Section 4.2.

Note: Some gas cylinders have a rounded base profile – where possible, the supplier removes such cylinders from “single cylinder” service and fits them into multiple cylinder packs or banks where the mountings and frame make the cylinders stable. If you suspect that you have a single cylinder with a rounded base profile, contact your supplier and take extra care when storing it.

4.4 Cylinder Capacity

Cylinders range from small lecture bottles, which are readily handled manually, to banks of large cylinders manifolded together that can only be handled with mechanical assistance.

Many small cylinders have a plastic guard fitted that allows them to be carried quite easily. Even so, it is recommended that the cylinders be moved in a properly secured trolley whenever practicable.

4.5 Damaged / Dirty or Wet Cylinders

Cylinders or their accessories that have become damaged are sources of potential harm as they may have sharp edges or may be coated with a hazardous substance following a fire. Such cylinders should be identified in order that appropriate action can be taken to minimise the risk of injury.

Dirt collecting on the bottom of a cylinder may make it unstable and similarly debris on the ground will also affect stability. Sweep storage and handling areas frequently and check cylinders before handling / moving.

Wet cylinders may be slippery. Extra care will be required when handling them. Avoid any attempt to lift large wet cylinders.

4.6 Trolleys

Wherever practicable, suitable trolleys should be used to move small quantities of cylinders. Two-wheeled trolleys, adapted to secure the cylinders whilst they are being moved, are the most versatile as they will assist the movement of cylinders over uneven ground and over kerbs. They can also be easily stowed on a vehicle to facilitate handling of cylinders during delivery operations.

Manual handling risk assessments should consider the following aspects of using a trolley:

1. Securing straps – Straps or chains to ensure that the cylinders cannot fall from the trolley must be fitted and used at all times.
2. **Handle Design** – Handles should be such that:
 - two-handed operation is required and so designed to avoid trapping / knocking of hands and elbows.
 - they should protrude far enough from the back of the trolley to prevent the operator knocking their shins against the back of the trolley.
 - the height of the handles with respect to the operator is appropriate. A height of 950 mm will be suitable for most people.
3. **Wheels** – Larger wheels of at least 200mm are recommended for cylinder trolleys. They have a lower rolling resistance than smaller wheels and will be less affected by uneven floor surfaces.

The trolley wheels should be sufficiently far apart so that the stability of the trolley / load is not impaired?
4. **The load height** – Does the operator have to twist around the load to see the direction of travel?
5. **The trolley / load width** with respect to the narrowest point of the travel route – there must be sufficient space to manoeuvre the trolley easily through any doorways / narrow openings to avoid trapping the hands.

6. **The force required** to move the trolley / load:

	Men	Women
Guideline figure for stopping or starting a load *	20 kg (About 200 Newtons)	15 kg (About 150 Newtons)
Guideline figure for keeping a load in motion *	10 kg (About 100 Newtons)	7 kg (About 70 Newtons)

* These guideline figures trigger the need for a detailed risk assessment.

Consideration should be given to the provision of brakes, which will facilitate loading and unloading of the cylinders or where there may be sloping surfaces.

7. **Other people in the workplace** – If the trolley is being used to carry heavy loads consideration must be given to how easy it will be to stop the load to prevent collisions.
8. **Maintenance** – Regular maintenance, particularly of the wheels and bearings, will ensure that the forces required to push and pull the cylinders are kept to a minimum. Other factors to consider are tread wear and corrosion.

Maintenance activities should also include a check of the cylinder securing mechanism (straps / chains etc).

4.7 **Cylinder pallets**

Always check that cylinders in pallets are stable before releasing strap or chain. **Remember** – if cylinders in a pallet are leaning or unstable – GET HELP before removing the restraining straps.

Never load cylinders into a pallet that has defective restraining straps or chains or severely distorted bases.

Ensure that the base is clear of debris.

Never “hide” round-bottomed or unstable cylinders in the middle of a pallet.

4.8 **Vehicles**

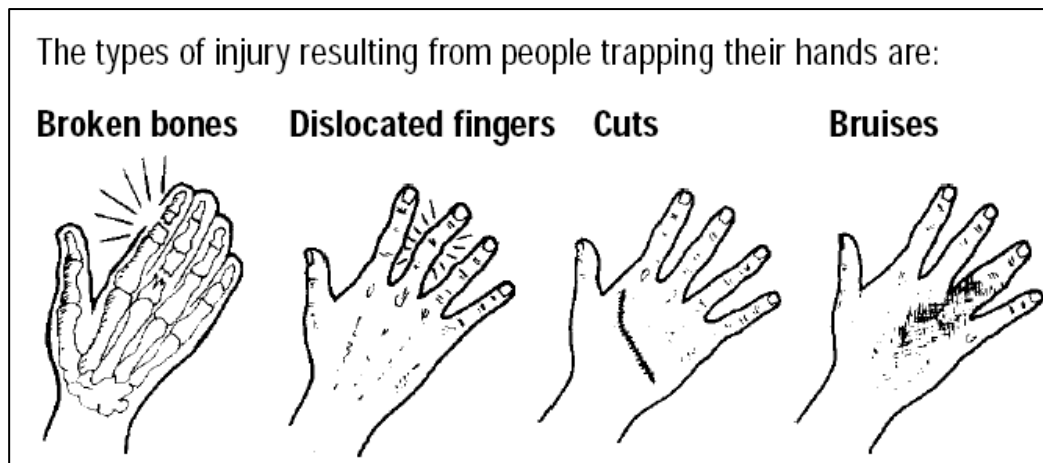
Handlers delivering cylinders vertically on custom-built vehicles should be aware of the hazards which can arise due to adverse weather and uneven or sloping delivery points.

There is also an increased risk of cylinder movement due to the vehicle swaying when walking on the delivery vehicle platform or through normal loading / unloading operations. All pallets should be strapped, except the pallet being worked on.

In addition to these hazards, where cylinders are transported on vehicles not specifically designed for carriage of cylinders there is a significant risk of injury during loading and unloading operations, particularly if it is necessary to handle cylinders in an awkward fashion or in a confined space.

4.9 Untrained/Unsuitable Personnel

Cylinder handling by inexperienced or untrained personnel can be hazardous, particularly on unsuitable surfaces – see Section 6. If cylinders are handled horizontally, the risk of injury is increased because of the need to bend, stoop and to lift cylinders, with the additional potential of trapping fingers.

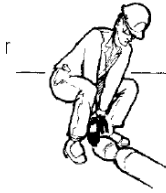


The causes of hand injuries are:

- Failure to wear proper protective clothing – hand protection is essential when handling cylinders. Stout gloves will greatly reduce the probability of cuts and abrasions.
- Trying to straighten cylinders or cylinders that are leaning in strapped pallets.
- Failing to remove the hand from between the cylinder being rolled and other cylinders or the side of pallets.
- Excessive speed – this is a cause of many accidents including trapped hands.
- Wet cylinders which can be slippery and therefore more difficult to handle.

4.10 How to raise the cylinders from the horizontal

Cylinders should be stored upright. If cylinders need to be lifted by hand from a horizontal position, the following method should be used:



Avoid injury by using correct lifting methods:

Foot position: hip width apart with one slightly in front of the other, astride the valve end of the cylinder.

Bend the knees to lower your body. This will enable your thigh muscles to do most of the lifting.

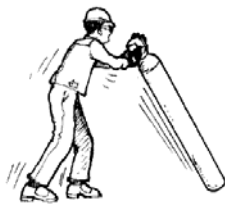


Ensure that the valve guard is secure then take a firm grip using both hands. Only lift using the valve guard if it has been designed for this purpose, otherwise grip the cylinder neck.



Keep your back straight throughout its length. (This does not mean it has to be vertical) Doing this will help to reduce strain on the back.

Pull your chin in so that your back is locked in a straight line.



Lift decisively with a smooth non-jerking motion. It is done initially by straightening the legs then following through with the arms at the same time walking forward until the cylinder is upright.

4.11 Moving Cylinders by Hand

The majority of cylinders are moved by “churning”, use of a trolley or by the use of pallets.



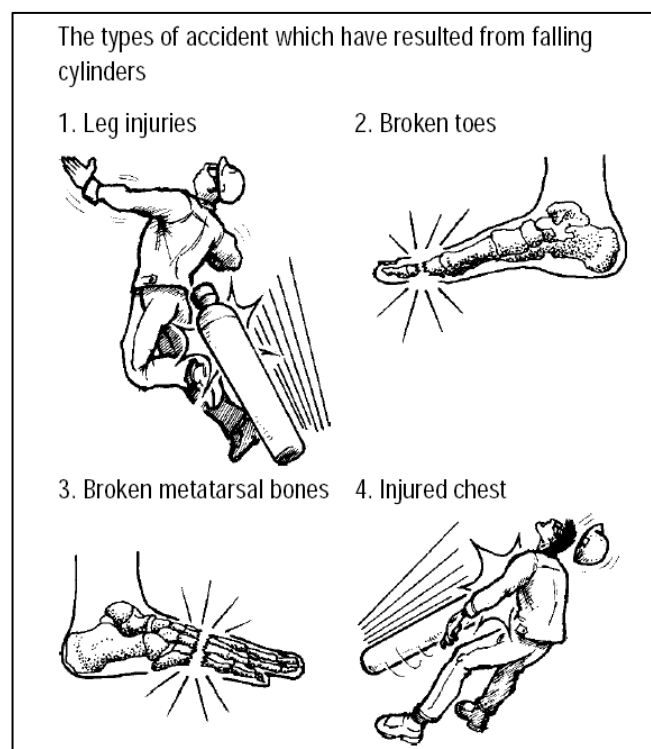
The “churning” method requires the use of both hands. One supports the cylinder whilst the other rotates the cylinder (away from the body). It requires the cylinder to be tilted slightly (again away from the body). The method takes some practice (ideally with empty, quite light cylinders such as aluminium alloy ones) and should only be attempted on a firm, even surface.

Churning should only be used for short distances (up to 5 metres). For longer distances or uneven or slippery surfaces, trolleys or mechanical aids should be used.

Cylinders should not be rolled horizontally along the ground since this may damage or even open the valve and will damage identifying marks and symbols.

Cylinders should not be moved with the valve open and should not be transported with the regulators and hoses attached, unless on a purposely designed trolley or carrier.

Cylinders should not be used as work-supports or rollers.



5 ASSESSMENTS

It is a legal requirement that, where it is not reasonably practical to avoid the need for employees to undertake manual handling operations, an assessment of risk must be undertaken. HSE has developed MAC, a new assessment tool, designed principally to assist health and safety inspectors to assess the most common risk factors in lifting, carrying and team handling operations. (See <http://www.hse.gov.uk/msd/index.htm>). Employers may also find the MAC useful to identify high-risk manual handling operations and to help them as part of their risk assessments, although it is noted that the MAC is not appropriate for manual handling operations that involve pulling or pushing of loads. See HSE Leaflet INDG 383 (4). See also HSE Leaflet “Five steps to risk assessment” (6)

5.1 Typical Factors to be considered

5.1.1 The Task

Can the cylinders be carried without stooping?

Does the cylinder require to be carried or lifted excessive distances?

5.1.2 Individual Capacity

Have individuals handling cylinders had specific training?

Are employees physically suited to handle the loads?

Does the task require more than one person to undertake it?

5.1.3 The Load

What is the weight? (From the safety data sheet or other source).

What is the size / shape?

If liquefied gas cylinder – is it empty?

What is the condition – wet, dirty, damaged? etc.

5.1.4 The Working Environment

Is the working area / route of travel:

- Well lit?
- Even floored?
- At suitable temperature?
- Tidy?
- Of an adequate size?

5.2 Assessment Checklist

HSE Guidance L23 (3) provides examples and worked examples of Manual Handling Checklists that may be copied freely and used as a basis for assessment.

BCGA have published a model risk assessment document specifically addressing cylinder handling as TIS 17.(7)

5.3 Who Should Carry Out The Assessment

Managers and supervisors with knowledge of the regulations and experience in manual handling operations may carry out the majority of the assessments. Employees' representatives should be consulted and involved in the risk assessment process.

5.4 Records and Review

5.4.1 Employers having 5 or more employees must document significant risks

5.4.2 All risk assessments shall be reviewed

- when there is reason to suspect that it is no longer valid
- when any significant changes are made or new information comes to light (e.g. following an accident or injury involving manual handling operations)
- periodically to take account of small changes in work practices which will eventually have a cumulative effect.

6 TRAINING

6.1 General Approach

Although the provision of information and training alone will not ensure safe manual handling, all employees engaged in the manual handling of gas cylinders must receive appropriate training. Detailed information on knowledge and training is given in L23 (3).

Training must not, however, be seen as the means of accepting a high-risk activity. Effective training should complement a safe system of work and the continual development of techniques and equipment to reduce the risk of injury.

6.2 Extent of Training

The content of any training programme will depend upon the degree of risk determined by the assessment.

Where it is found not reasonably practicable to avoid manual handling, employees must be provided with precise information on the load and its characteristics and receive instruction in the techniques of handling.

6.3 Information and Instruction

For compressed gas cylinders the information provided to the employees should include:

- weight
- advice on stability
- position of hand holds and attachment points
- safe use of lifting devices and other mechanical aids
- the importance of good housekeeping
- how to identify unstable/unsafe cylinder loads
- the necessary protective equipment for each activity
- how to “churn”, “dolly” or “roll” cylinders vertically
- not turning your back on a potentially unstable cylinder or attempting to catch a falling cylinder.

For the employees handling cylinders, advice must be given in the basic requirements of the regulations and instructions on basic handling techniques, i.e. basic lifting practice, positioning of feet and hands, smooth non-jerking motion and taking account of environmental conditions.

Short, concise, written work instructions are often useful guidance to employees to remind them of the safe handling techniques.

It may be necessary for work instructions to clearly identify and prohibit certain manual handling activities that have given rise to accidents and personal injury in the past.

6.4 Training Implementation

The form of training will differ according to involvement with the handling operations and will vary with levels of responsibility.

Employers must ensure that proper systems of work are in place and work instructions on manual handling operations are complied with.

Experienced employees may be valuable in determining the best handling techniques during the evaluation of the assessment, although consideration should be given to the possibility that experienced employees may have picked up a ‘poor technique’ over the years – possibly due to a cumulative MSD, and is then passing on poor lifting techniques to new and inexperienced workers.

Individual employee limitations such as physically characteristics and capability should be taken into account.

Advice and information on training for customers and third parties, offered by suppliers, can be of benefit in reducing accidents in the gas user industries.

7 REFERENCES *

	<u>Document Number</u>	<u>Title</u>
1	SI 1992:2793	Manual Handling Operations Regulations 1992
2	SI 2002:2174	Health and Safety (Miscellaneous Amendments) Regulations 2002
3	HSE L23	Guidance on Regulations - ISBN No 0 7176 2823
4	HSE INDG383	Manual Handling Assessment Charts (MAC)
5	HSE Research Report 228.	Review of the risks associated with pushing and pulling heavy loads
6	HSE INDG163 (Rev 1)	Five steps to risk assessment
7	BCGA TIS 17	Risk assessment – Manual handling

Further information can be obtained from:

Health and Safety Executive

www.hse.gov.uk

<http://www.hse.gov.uk/msd/index.htm>

HSE Books

www.hsebooks.co.uk

HMSO

www.hmso.gov.uk

Introduction

Musculoskeletal disorders (MSDs) are the most common occupational illness in Great Britain, affecting 1 million people a year. MSDs affect muscles, joints, tendons and other parts of the musculoskeletal system.

Employees performing tasks that include any of the following risk factors are at most risk of developing some type of MSD:

- Repetitive and heavy lifting
- Bending and twisting
- Repeating an action too frequently
- Uncomfortable working position
- Exerting too much force
- Working too long without breaks
- Adverse working environment e.g. hot, cold

If more than one of these risk factors are present, the risk is usually higher.

The Manual Handling Operations Regulations state that employers must avoid hazardous manual handling operations so far as is reasonably practicable. If they cannot be avoided they must carry out a Manual Handling Risk Assessment.

Gas cylinders can be difficult objects to move safely. Large cylinders may weigh upwards of 100kg, they are tall and thin and can therefore topple easily. This model document provides assistance with the production of a risk assessment for cylinder handling operations. In some instances a full risk assessment may not be required, to assist with this decision please refer to the "Filter" page.

The following operations are considered:

- 1) Moving cylinders by hand (lifting and carrying)
- 2) Moving cylinders by hand (churning*)
- 3) Moving cylinders by trolley
- 4) Raising cylinders from the horizontal

For instructions on how to use the model risk assessment refer to " What to Do" page.

*Churning is when the cylinder base remains in contact with the ground and the cylinder is rotated by hand whilst tilted at a slight angle in order to move it

It should be noted that this model risk assessment only considers risks associated with manual handling of cylinders; it does not take into account other hazards associated with cylinders such as contents, i.e. pressure and chemical hazards (asphyxiant, toxic, corrosive, flammable). These must be considered separately.

How Do You Rate Risk?

Risk is a combination of the likelihood of an incident occurring and the severity of the injury or loss due to the incident. The Likelihood versus Severity Matrix below is a means for rating risk.

Likelihood / Severity Matrix

		Risk Rating		
LIKELIHOOD	High	Medium	High	High
	Medium	Low	Medium	High
	Low	Low	Low	Medium
		Low	Medium	High
		SEVERITY		

Likelihood: Based on the precautions/controls in place to prevent an incident occurring.

High:	Where no precautions are put in place and the employee can only avoid an incident by following verbally communicated procedures - which typically are only short term. No physical barriers or controls in place.
Medium:	Limited physical barriers or controls in place. The employee can only avoid an incident by working carefully, following training, work instructions and safety procedures.
Low:	Physical barriers or engineering controls such as use of handling aids to minimise the likelihood.

Severity: The degree of injury to the employee or third party, or the cost of loss due to property damage.

Injury

High:	Death or disabling injury.
Medium:	Serious injuries requiring medical treatment and time off from work.
Low:	Minor injuries.

Loss

		Business Size	
		Large	Small
High:	Where the cost of the incident would exceed:	£100,000	£20,000
Medium:	Where the cost of the incident is between:	£10,000 & £100,000	£2000 & £20,000
Low:	Where the cost of the incident could reasonably be expected to be less than:	£10,000	£2,000

How to carry out the assessment

The risk assessment should be carried out by persons who have been trained in manual handling, are familiar with the tasks being assessed and understand the concept of risk assessment.

1	Establish whether a full risk assessment is required by completing the "Filter" form.
2	If a full assessment is not required, record the details on the "Filter" form
3	If a full assessment is required, select the Risk Assessment form for the activity to be risk assessed.
4	Enter details in required fields at the top of the Risk Assessment form.
5	Record the existing control measures beside the recommended control measures.
6	Work through the questions to consider, and if the answer is yes decide, if the associated risk is low, medium or high.
7	Add further details in the ' problems occurring from the task ' and ' possible remedial action ' columns.
8	Once you have answered all the questions, use the answers to make an overall assessment of the risk of injury as low, medium or high and record this on the form. Risk = Low - activity is adequately controlled Risk = Medium - activity carries a minor residual risk or is not adequately controlled Risk = High - activity is not adequately controlled
9	If the result is medium or high, decide what action is required to reduce the risk to 'as low as reasonably practicable' (ALARP) and record this in the Action Plan.
10	Do not continue with the activity until risk is reduced to as low as reasonably practicable (ALARP).

Risk Assessment Filter

Use this filter if you think that the activity to be assessed is low risk - it will quickly and easily confirm this. Go straight to a full risk assessment if you think the activity being assessed involves a significant risk from manual handling.

Activity name:

Activity description:

Observe the activity being assessed and answer the questions below.

If you answer yes to any of the questions, a full risk assessment is required.

If you answer no to all the questions and you believe the activity to be low risk use this form to record this.

General

- 1) Is the activity carried out once per minute or more frequently?
- 2) Does the activity involve handling whilst seated?
- 3) Does the activity involve twisting whilst handling (the upper body is moved whilst keeping the feet static)?
- 4) Does the load have to be carried more than 10m without the opportunity to rest?
- 5) Are any personnel involved in the activity at high risk e.g. pregnant, young, suffering from an MSD?

Yes / No

Yes / No

Yes / No

Yes / No

Yes / No

Lifting, Lowering and Carrying Cylinders

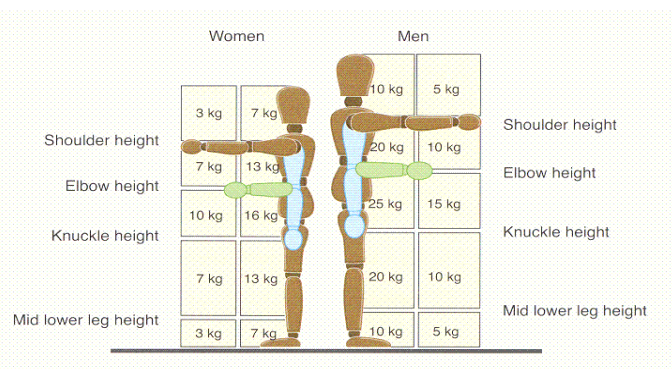


Figure 23 Lifting and lowering

- 1) Considering the specific manual handling activity and referring to the diagram above, is the maximum weight being handled more than the weight in any of the boxes through which the hands of the individual handler pass?

Yes / No

- 2) Do the hands of the individual handler pass outside the box zones in the diagram at any time e.g. above head height ?

Yes / No

Pushing and Pulling a Cylinder Trolley

- 1) Is the surface which the load is being moved over uneven or soft?
- 2) Are there slopes, ramps or steps present?
- 3) Are there trapping hazards or confined spaces present?

Yes / No

Yes / No

Yes / No

Churning Cylinders

- 1) Does the activity involve churning cylinders?

Yes / No

Raising Cylinders from the Horizontal

- 1) Does the task involve raising cylinders from the horizontal?

Yes / No

Model Risk Assessment for moving cylinders by hand (carrying)

Activity name	Carrying cylinders	Personnel involved	B. Smith, R. Jones, L. Williams
Activity description	Moving cylinders between storage stillages (point A to point B, see Figure 1)	Do they undertake other handling tasks?	Yes
Load weight	approximately 15kg	Assessment Date	Dec-08
Frequency of activity	10+ times a day per operative	Review Date	Jun-09
Carrying distance	5-10m	Assessed by	D. Roberts
Location	Cylinder preparation area	Reviewed by	
		Discussed with employee safety representatives?	Yes

Overall assessment of the risk of injury <small>(Complete tables below prior to making overall assessment)</small>	MEDIUM
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Recommended control measures	Existing Control Measures
<ol style="list-style-type: none"> 1) Remove or reduce the need for carrying cylinders by introducing use of mechanical handling aids e.g. palletisation and use of fork lift truck or hoists 2) Remove or reduce the need for carrying cylinders by introducing use of trolleys or hand lift trucks 3) Reduce handling distances e.g. from storage to loading point 4) Review ergonomics to remove or reduce the need for stretching or twisting 5) Review work areas to eliminate or reduce defects e.g. uneven floors, trapping hazards/confined spaces, steps, slopes or ramps 6) Provide information to personnel involved on weights of the cylinders 7) Avoid handling damaged or wet cylinders or those with dirt on the bottom 8) Provide training to personnel involved on safe handling techniques and safe use of lifting devices 9) Introduce PPE as required e.g. protective footwear, gloves and safety glasses 10) Ensure securing chains or straps are available for securing cylinders after handling 	<p>There are no steps, slopes or ramps in the cylinder preparation area and the floor is in good condition.</p> <p>All Operatives wear safety footwear at all times</p> <p>Cylinder stillages are all fitted with securing bars to prevent cylinders from falling over</p>

Questions to consider:	If yes, tick the appropriate level of risk			Problems occurring from the task <small>(make notes in this column in preparation for the remedial action to be taken)</small>	Possible remedial action <small>(eg changes that need to be made to the task, load, working environment etc. and who needs to be involved in implementation)</small>
	Low	Med	High		
1. Does the task involve:					
- holding cylinders away from the body?			✓	Obstacles on the route mean that the cylinder is held away from the body (see Figures 2b & 2c) Obstacles on the route and the technique used result in twisting (see Figures 2a, 2c & 2e) The technique used (picking the cylinder up with one hand at the base) results in stooping (see Figure 2a)	The route should be cleared prior to the cylinder being moved As above / below The cylinders should not be carried but should be churned or moved by trolley
- twisting?		✓			
- stooping?		✓			
- reaching upwards?					
- large vertical movements?					
- long carrying distances?					
- unpredictable movement of cylinders?					
- repetitive cylinder handling?					
- insufficient rest or recovery?					
- a work rate imposed by a process?					
2. Are the cylinders:					
- heavy?		✓		Cylinder weight is approximately 15kg and there is stooping, twisting and stretching involved	The cylinders should not be carried but should be churned or moved by trolley. The route should be cleared prior to the cylinder being moved
- bulky/unwieldy?					
- difficult to grasp?					
- unstable/unpredictable?					

- intrinsically harmful e.g. toxic, at high pressure?		✓		Some cylinders are at high pressure and may have toxic contents	The contents and pressure of the cylinder would present a much lower risk if the cylinder was churned or moved by trolley as it is less likely to be dropped
3. In the working environment are there:					
- constraints on posture?				The stillage at point A has a small ramp (see Figure 1)	This ramp would present a much lower risk if the cylinder was churned as the base remains in contact with the floor at all times
- poor floors?					
- variations in levels?		✓			
- hot/cold/humid conditions?					
- strong air movements?					
- poor lighting conditions?					
4. Consider individual capability - does the job:					
- require particular strength, height or other capability?			✓	Particular strength is needed to carry cylinders	The cylinders should not be carried but should be churned or moved by trolley. This requires less strength as the full weight of the cylinder does not need to be supported
- pose an increased risk to those with a health problem or a physical or learning difficulty?			✓	Physical effort required to move cylinders could increase risk of injury to operatives with health issues	As above
- pose an increased risk to those who are pregnant?			✓	Yes, although there are currently no female operatives	Requires review if any female operatives are employed
- call for special information/training?			✓	Specialist training is required to move cylinders safely	Training required for all operatives
5. Other factors to consider:					
- Is movement or posture hindered by clothing or personal protective equipment?		No		Only protective footwear is being worn	Consider use of protective gloves, safety glasses and high visibility clothing
- Is the correct/suitable PPE being worn?		No			
- Are there sudden changes in workload or seasonal changes?		No			
ACTION PLAN					
Remedial steps that should be taken (in priority order)		Person responsible for implementing controls		Target implementation date	Completed?
Cylinder of this size or larger must not be carried - they must be moved by churning or trolley in future		Production Manager to discuss with all operatives		Immediately	Yes
All operatives to undergo manual handling training to include information on safe cylinder moving technique (churning, use of trolleys, ensuring route is kept clear)		Production Manager		Jan-09	Booked 15 January 2009
Securing bars on stillages must be used at all times		Production Manager to discuss with all operatives		Immediately	Yes
Provide gloves, safety glasses and high visibility clothing to all operatives and ensure it is worn as appropriate		Production Manager		Jan-09	Yes
Review workplace to ensure minimum number of cylinder movements required over shortest distance possible		Production Manager		Feb-09	No
Additional references:	BCGA GN3 Safe Cylinder Handling and the Application of the Manual Handling Operations Regulations to Gas Cylinders, BCGA TIS12 Handle Gas Cylinders Safely, Manual Handling Operations Regulations, HSE L23 Guidance on Regulations, HSE INDG383 Manual Handling Assessment Charts (MAC), HSE INDG163 Five Steps to Risk Assessment.				

Model Risk Assessment for Moving Cylinders by Hand (Carrying)

Figure 1 The activity - moving a 20L cylinder from point A to point B



Figure 1

Figures 2a-2f Observation of the activity being undertaken



Figure 2a

The cylinder is being lifted by placing one hand under the base. This is causing the operative to stoop and twist.



Figure 2b

The route has not been cleared and the pallets are creating an obstacle.



Figure 2c

The operative is stooping, twisting and stretching to move the cylinder to the other side of the pallets.



Figure 2d

No PPE is being worn except safety shoes. Using this method to carry the cylinder increases the likelihood of it being dropped.



Figure 2e

Another obstacle is causing the operative to stretch to reach the destination stillage.



Figure 2f

The securing bars have not been used to secure the cylinders in the stillage.

Figures 3a-3f Observation of the activity being undertaken once control measures have been implemented



Figure 3a

The route has been cleared and the securing bar is removed from the destination stillage prior to commencing the operation.



Figure 3b

The cylinder is churned down the ramp, preventing the need for stooping or twisting.



Figure 3c

The route is cleared of obstacles and the cylinder is churned to the destination stillage. Churning instead of carrying reduces the risk of musculoskeletal injury and reduces the likelihood of the cylinder being dropped. Additional PPE is also worn (gloves, safety glasses, high visibility clothing).



Figure 3d

The cylinder is placed in the destination stillage.



Figure 3e

The securing bar is replaced on the stillage.

Model Risk Assessment for moving cylinders by hand (churning)

Activity name	Churning cylinders	Personnel involved	H.Roddy, I.Constable, J.Broughton
Activity description	moving cylinder from outside to inside	Do they undertake other handling tasks?	Yes
Load weight	90kg large cylinder	Assessment Date	19/01/2009
Frequency of activity	2+ times daily	Review Date	Jul-09
Carrying distance	30m	Assessed by	L.Sadler
Location	Storage facility	Reviewed by	
		Discussed with employee safety representatives?	Yes

Overall assessment of the risk of injury <small>(Complete tables below prior to making overall assessment)</small>	HIGH / MEDIUM
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Recommended control measures	Existing Control Measures
<ol style="list-style-type: none"> 1) Only use the churning method for short distances (less than 5m). If distances are greater than this use mechanical handling aids e.g. palletisation and use of fork lift truck, hoists, hand trolleys or hand lift trucks 2) Only use the churning method on firm, even, non-slippery surfaces 3) Reduce handling distances e.g. from storage to loading point 4) Review ergonomics to remove or reduce the need for stretching or twisting 5) Review work areas to eliminate or reduce defects e.g. uneven floors, trapping hazards/confined spaces, steps, slopes or ramps 6) Provide information to personnel involved on weights of the cylinders 7) Avoid handling damaged or wet cylinders or those with dirt on the bottom 8) Provide training to personnel involved on safe churning technique 9) Introduce PPE as required e.g. protective footwear, gloves and safety glasses 10) Ensure securing chains or straps are available for securing cylinders after handling 	<p>All operatives wear safety footwear at all times</p>

Questions to consider:	If yes, tick the appropriate level of risk			Problems occurring from the task <small>(make notes in this column in preparation for the remedial action to be taken)</small>	Possible remedial action <small>(eg changes that need to be made to the task, load, working environment etc. and who needs to be involved in implementation)</small>
	Low	Med	High		
1. Does the task involve:					
- twisting?		✓		The operative has to hold a proportion of the weight throughout the task - he can only rest if he stops & stands the cylinder upright (fig.2a). He needs to be physically able to hold the weight during complicated moves (opening & holding doors open whilst churning cylinder). Negotiating the doorways involves twisting while taking weight of cylinder on one side of his body (fig 2c,d,e and f)	Use of an appropriate cylinder trolley ensures that the cylinder is secure at all times, the trolley can be stood upright whilst the operative opens doorways to clear access. Consider 3 or 4 wheel trolleys so that the operative does not support any weight at all.
- stooping?					
- reaching upwards?					
- large vertical movements?					
- long carrying distances?		✓			
- unpredictable movement of cylinders?			✓		
- repetitive cylinder handling?		✓			
- insufficient rest or recovery?			✓		
- a work rate imposed by a process?		✓			
2. Are the cylinders:				The cylinder is large - approximately 90kg. A significant proportion of which is being held by the operative. His physical capacity needs to match the load he is expected to lift. The likelihood of dropping the cylinder increases with decreased capability of operative. The cylinder is being tilted & churning on the edge of its base and could slip leading to loss of control and dropping the cylinder (potential MSD injury to operative) Cylinders contain gases at high pressure, in some cases these are toxic gases (an additional risk assessment must be carried out with regard to gases used/stored on site)	Use of an appropriate cylinder trolley ensures that the operative is in direct control of the cylinder. The cylinder is secured by cylinder restraints into the trolley. The operative is holding less weight and can place trolley upright so he can rest. Consider 3 or 4 wheel trolleys so that the operative does not support any weight at all. Consider use of smaller cylinders. The contents of gas & pressure present a much lower risk when the trolley is secured on a trolley.
- heavy?			✓		
- bulky/unwieldy?					
- difficult to grasp?					
- unstable/unpredictable?			✓		
- intrinsically harmful e.g. toxic, at high pressure?		✓			

				use/stored on site).	
3. In the working environment are there:				<p>The operative is moving the cylinder from outside - ground was wet on day of assessment. Depending on the time of year it could be hot, cold, wet or icy. There is also a slope up to the door, which has a grid that may be slippery and uneven. In addition, the operative has to step up from the side of the slope while holding the weight of the cylinder (fig 2b,c)</p> <p>Negotiating the doorway involves twisting, stretching & holding weight of door whilst supporting weight and trying to churn cylinder through the doorways (fig 2c, d,e & f). The change in surface material from outside to inside could increase the risk of slipping.</p>	<p>Use of a trolley ensures that the cylinder is secure (won't slip) whilst negotiating the slope, doorway and change of surfaces. The full weight of the cylinder is not being carried by the operative thus reducing the risk of MSD's. Consider 3 or 4 wheel trolleys so that the operative does not support any weight at all.</p>
- constraints on posture?		✓			
- poor floors?		✓			
- variations in levels?			✓		
- hot/cold/humid conditions?		✓			
- strong air movements?					
- poor lighting conditions?					
4. Consider individual capability - does the job:				<p>The cylinder is large - approximately 90kg. A significant proportion of which is being held by the operative. The individual's physical capability needs to match the load he is expected to lift. The likelihood of dropping the cylinder increases with decreased capability of the individual. Specific manual handling training for churning a cylinder is required.</p>	<p>The cylinder should be moved by trolley. This requires less strength as the full weight of the cylinder does not need to be supported by the individual. Consider 3 or 4 wheel trolleys so that the operative does not support any weight at all. Consider use of smaller cylinders. Specific manual handling training is required for all operatives. Requires an individual review in case of pregnancy.</p>
- require particular strength, height or other capability?			✓		
- pose an increased risk to those with a health problem or a physical or learning difficulty?			✓		
- pose an increased risk to those who are pregnant?			✓		
- call for special information/training?			✓		
5. Other factors to consider:				<p>Only protective footwear is being worn.</p> <p>As the operation involves moving the cylinder from outside seasonal changes will affect the workload.</p>	<p>Consider use of protective gloves, safety glasses and high visibility clothing.</p> <p>Wet, icy cold weather will be potentially slippery - ensure that area is free from ice and the operative is wearing suitable clothing and footwear. Using a trolley reduces the risk of dropping the cylinder.</p>
- Is movement or posture hindered by clothing or personal protective equipment?		No			
- Is the correct/suitable PPE being worn?		No			
- Are there sudden changes in workload or seasonal changes?		Yes			
ACTION PLAN					
Remedial steps that should be taken (in priority order)		Person responsible for implementing controls	Target implementation date	Completed?	
All manual handling of cylinders to be carried out using appropriate cylinder trolleys, consider 3 or 4 wheel trolleys for large cylinders so that all of the cylinder weight is taken by the trolley not the operative.		Production Manager to discuss with all operatives	Immediately		
Provide gloves, safety glasses and high visibility clothing to all operatives and ensure it is worn as appropriate		Production Manager	Immediately		
All operatives to undergo manual handling training to include information on safe cylinder moving technique (use of trolleys, ensuring route is kept clear)		Production Manager	Feb-09		
Review workplace to ensure minimum number of cylinder movements required over shortest distance possible		Production Manager	Feb-09		
Consider use of smaller cylinders.		Production Manager	Feb-09		
Additional references:	<p>BCGA GN3 Safe Cylinder Handling and the Application of the Manual Handling Operations Regulations to Gas Cylinders, BCGA TIS12 Handle Gas Cylinders Safely, Manual Handling Operations Regulations, HSE L23 Guidance on Regulations, HSE INDG383 Manual Handling Assessment Charts (MAC), HSE INDG163 Five Steps to Risk Assessment.</p>				

Model Risk Assessment for Moving Cylinders by Hand (Churning)

Figure 1 The activity - moving a 50L cylinder from point A to point B

Point A



Point B



Figure 1

Figures 2a-2g Observation of the activity being undertaken



Figure 2a

The cylinder weight is being supported and guided by the operative whilst pivoting on its base. This is causing the operative to take some of the weight of the cylinder with his right arm. The physical capability of the operative relates directly to his/her ability to maintain direct control of the cylinder whilst milk churning. No PPE is being worn except safety shoes.



Figure 2b

The route has not been cleared. The door has not been secured in an open position. In addition, there is a slope with a potentially slippery uneven surface. The operative is taking increasing amounts of the cylinder weight as he is standing below the level of the cylinder. He will need to negotiate stepping up while supporting the cylinder, increasing the risk of dropping the cylinder and injuring himself.



Figure 2c

The operative is twisting and stretching to open the door, whilst supporting the weight of the cylinder on a slope. In addition, there is a risk of someone exiting the door, which could lead to the cylinder being dropped.



Figure 2d

The complicated task of using his foot to keep the door open whilst moving the cylinder into the building increases the likelihood loss of control.



Figure 2e

The operative is again taking increasing amounts of the cylinder weight on his right side as he enters the building. The cylinder base is wet – as it is moved over the threshold it could slip. There is also a danger that as the door closes he may lose his balance and drop the cylinder. The closed caged door poses another obstacle.



Figure 2f



Again, the operative has to negotiate a doorway. Leading to twisting and stretching to open the door, whilst supporting the weight of the cylinder.

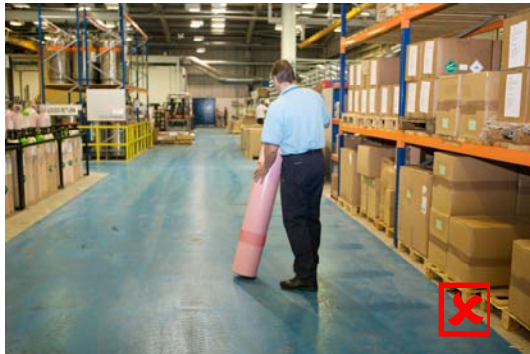


Figure 2g

The operative now has to milk churn the length of the building. Over this distance the task is physically & mentally demanding. In addition to tiredness, other potential obstacles such as pallets, personnel and the forklift increase the likelihood of injury & the cylinder being dropped.

Figures 3a-3f Observation of the activity being undertaken once control measures have been implemented



Figure 3a

The operative is wearing appropriate PPE. The cylinder is secured on an appropriate cylinder trolley. The door has been secured, prior to commencing the operation, in an open position to allow unrestricted access.



Figure 3b

The operative negotiates the doorway without the risk of twisting, slipping or losing control and dropping the cylinder. Although the operative is taking some of the weight it is close to the body – at any time the operative can place the trolley upright to rest (to open/close doors).

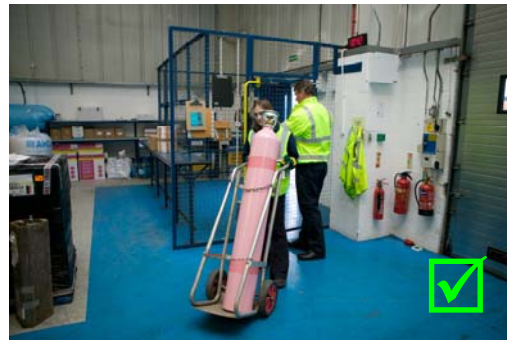


Figure 3c

The second doorway can either be opened by a colleague or propped open during the operation. The door can be closed by the operative/colleague prior to continuing the operation.

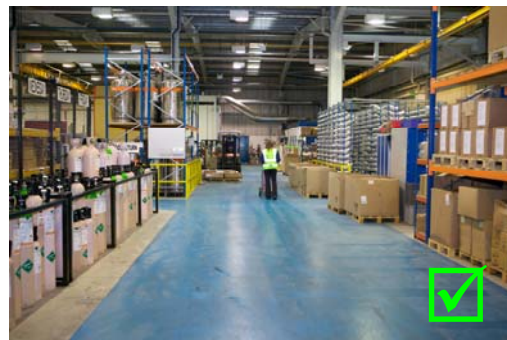


Figure 3d

The cylinder can be safely transported to the delivery point. At any time the trolley can be placed securely upright. The trolley allows the operative to negotiate obstacles while maintaining control of the cylinder.

Model Risk Assessment for moving cylinders by trolley

Activity name <input style="width: 90%;" type="text"/>	Personnel involved <input style="width: 90%;" type="text"/>
Activity description <input style="width: 90%;" type="text"/>	Do they undertake other handling tasks? <input style="width: 90%;" type="text" value="Yes / No"/>
Load weight <input style="width: 90%;" type="text"/>	Assessment Date <input style="width: 90%;" type="text"/>
Frequency of activity <input style="width: 90%;" type="text"/>	Review Date <input style="width: 90%;" type="text"/>
Carrying distance <input style="width: 90%;" type="text"/>	Assessed by <input style="width: 90%;" type="text"/>
Location <input style="width: 90%;" type="text"/>	Reviewed by <input style="width: 90%;" type="text"/>
Discussed with employee safety representatives? <input style="width: 90%;" type="text" value="Yes / No"/>	

Overall assessment of the risk of injury <small>(Complete tables below prior to making overall assessment)</small>	HIGH / MEDIUM / LOW
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Recommended control measures	Existing Control Measures
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- 1) Remove or reduce the need for using trolleys by introducing use of mechanical handling aids e.g. palletisation and use of fork lift truck or hoists
- 2) Reduce handling distances e.g. from storage to loading point
- 3) Ensure trolleys are of an appropriate design with the following features: of a suitable height for the operator (usually 950mm)
 - handles which require 2-handed operation and protrude far enough from the back of the trolley to prevent the operator knocking their shins
 - two wheels which are at least 200mm and are far enough apart to ensure stability
 - consider providing brakes
- 4) Ensure trolleys are fitted with a cylinder securing mechanism e.g. strap or chain
- 5) Ensure trolleys are regularly maintained, particularly the wheels and bearings. Wheel tread, corrosion and the cylinder securing mechanism should also be checked regularly.
- 6) Review ergonomics to remove or reduce the need for stretching or twisting
- 7) Review travel routes to eliminate or reduce defects e.g. uneven floors, trapping hazards/confined spaces, steps, slopes or ramps
- 8) Provide information to personnel involved on weights of the cylinders
- 9) Avoid handling damaged or wet cylinders or those with dirt on the bottom
- 10) Provide training to personnel involved on safe handling techniques and safe use of trolleys
- 11) Introduce PPE as required e.g. protective footwear, gloves and safety glasses
- 12) Ensure securing chains or straps are available for securing cylinders after handling

Questions to consider:	If yes, tick the appropriate level of risk	Problems occurring from the task <small>(make notes in this column in preparation for the remedial action to be taken)</small>	Possible remedial action <small>(eg changes that need to be made to the task, load, working environment etc. and who needs to be involved in implementation)</small>			
	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 33%; text-align: center; font-weight: bold;">Low</td> <td style="width: 33%; text-align: center; font-weight: bold;">Med</td> <td style="width: 33%; text-align: center; font-weight: bold;">High</td> </tr> </table>	Low	Med	High		
Low	Med	High				

1. Does the task involve:			
- holding cylinders away from the body?			
- twisting?			
- stooping?			
- reaching upwards?			
- large vertical movements?			
- long carrying distances?			
- unpredictable movement of cylinders?			
- repetitive cylinder handling?			
- insufficient rest or recovery?			
- a work rate imposed by a process?			
2. Are the cylinders:			

- heavy?				
- bulky/unwieldy?				
- difficult to grasp?				
- unstable/unpredictable?				
- intrinsically harmful e.g. toxic, at high pressure?				
3. In the working environment are there:				
- constraints on posture?				
- poor floors?				
- variations in levels?				
- hot/cold/humid conditions?				
- strong air movements?				
- poor lighting conditions?				
4. Consider individual capability - does the job:				
- require particular strength, height or other capability?				
- pose an increased risk to those with a health problem or a physical or learning difficulty?				
- pose an increased risk to those who are pregnant?				
- call for special information/training?				
5. Other factors to consider:				
- Is movement or posture hindered by clothing or personal protective equipment?		Yes / No		
- Is the correct/suitable PPE being worn?		Yes / No		
- Are there sudden changes in workload or seasonal changes?		Yes / No		
ACTION PLAN				
Remedial steps that should be taken (in priority order)		Person responsible for implementing controls	Target implementation date	Completed?
Additional references:	BCGA GN3 Safe Cylinder Handling and the Application of the Manual Handling Operations Regulations to Gas Cylinders, BCGA TIS12 Handle Gas Cylinders Safely, Manual Handling Operations Regulations, HSE L23 Guidance on Regulations, HSE INDG383 Manual Handling Assessment Charts (MAC), HSE INDG163 Five Steps to Risk Assessment.			

Model Risk Assessment for raising cylinders from the horizontal

Activity name <input style="width: 90%;" type="text"/>	Personnel involved <input style="width: 90%;" type="text"/>
Activity description <input style="width: 90%;" type="text"/>	Do they undertake other handling tasks? <input style="width: 90%;" type="text" value="Yes / No"/>
Load weight <input style="width: 90%;" type="text"/>	Assessment Date <input style="width: 90%;" type="text"/>
Frequency of activity <input style="width: 90%;" type="text"/>	Review Date <input style="width: 90%;" type="text"/>
Carrying distance <input style="width: 90%;" type="text"/>	Assessed by <input style="width: 90%;" type="text"/>
Location <input style="width: 90%;" type="text"/>	Reviewed by <input style="width: 90%;" type="text"/>
Discussed with employee safety representatives? <input style="width: 90%;" type="text" value="Yes / No"/>	

Overall assessment of the risk of injury <small>(Complete tables below prior to making overall assessment)</small>	HIGH / MEDIUM / LOW
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Recommended control measures	Existing Control Measures
1) Remove or reduce the need for raising cylinders from the horizontal by storing and transporting cylinders vertically 2) Avoid raising damaged or wet cylinders or those with dirt on the bottom 3) Provide training to personnel involved on safe techniques for raising cylinders from the horizontal 4) Review work areas to eliminate or reduce defects e.g. slippery floors, trapping hazards or confined spaces 5) Provide information to personnel involved on weights of the cylinders 6) Introduce PPE as required e.g. protective footwear, gloves and safety glasses 7) Ensure securing chains or straps are available for securing cylinders after handling	

Questions to consider:	If yes, tick the appropriate level of risk			Problems occurring from the task <small>(make notes in this column in preparation for the remedial action to be taken)</small>	Possible remedial action <small>(eg changes that need to be made to the task, load, working environment etc. and who needs to be involved in implementation)</small>
	Low	Med	High		
1. Does the task involve:					
- twisting?					
- stooping?					
- unpredictable movement of cylinders?					
- repetitive cylinder handling?					
- insufficient rest or recovery?					
- a work rate imposed by a process?					
2. Are the cylinders:					
- heavy?					
- bulky/unwieldy?					
- difficult to grasp?					
- unstable/unpredictable?					
- intrinsically harmful e.g. toxic, at high pressure?					
3. In the working environment are there:					
- constraints on posture?					
- poor floors?					
- hot/cold/humid conditions?					
- strong air movements?					

- poor lighting conditions?					
4. Consider individual capability - does the job:					
- require particular strength, height or other capability?					
- pose an increased risk to those with a health problem or a physical or learning difficulty?					
- pose an increased risk to those who are pregnant?					
- call for special information/training?					
5. Other factors to consider:					
- Is movement or posture hindered by clothing or personal protective equipment?		Yes / No			
- Is the correct/suitable PPE being worn?		Yes / No			
- Are there sudden changes in workload or seasonal changes?		Yes / No			
ACTION PLAN					
Remedial steps that should be taken (in priority order)			Person responsible for implementing controls	Target implementation date	Completed?
Additional references:	BCGA GN3 Safe Cylinder Handling and the Application of the Manual Handling Operations Regulations to Gas Cylinders, BCGA TIS12 Handle Gas Cylinders Safely, Manual Handling Operations Regulations, HSE L23 Guidance on Regulations, HSE INDG383 Manual Handling Assessment Charts (MAC), HSE INDG163 Five Steps to Risk Assessment.				