



GUIDANCE NOTE 25

**GUIDANCE ON ASSESSING THE
COMPETENCY OF PERSONNEL
UNDERTAKING PERIODIC INSPECTION
AND TESTING OF GAS CYLINDERS**

2015

British Compressed Gases Association

GUIDANCE NOTE 25

GUIDANCE ON ASSESSING THE COMPETENCY OF PERSONNEL UNDERTAKING PERIODIC INSPECTION AND TESTING OF GAS CYLINDERS

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PREFACE

The British Compressed Gases Association (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, food and medical 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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* Throughout this publication the numbers in brackets refer to references in Section 5. Documents referenced are the edition current at the time of publication, unless otherwise stated.

TERMINOLOGY AND DEFINITIONS

Assessment (of a person)	The process of measuring a person's competence by one or more means.
Assessor (A)	The designated person to carry out the competency assessment.
Coach / Trainer (C/T)	Internal / external provider of appropriate training.
Competence	The ability to apply / combine the necessary practical and theoretical experience/knowledge, skills & personal attributes, to allow safe and effective inspections.
Director (D)	Designated person responsible for competency assessment activity.
Gas cylinder	For the purpose of this document a gas cylinder is deemed to be a refillable pressure receptacle, which is defined in ADR (7) as a collective term that includes cylinders, tubes, pressure drums, and bundles of cylinders.
Inspector / Examiner (I/E)	The person being assessed who makes judgements on periodic inspection of gas cylinders.
May	Indicates an option available to the user of this Guidance Note.
Operator (O)	Persons performing operations not exercising judgements.
Shall	Indicates a mandatory requirement for compliance with this Guidance Note and may also indicate a mandatory requirement within UK law.
Should	Indicates a preferred requirement but is not mandatory for compliance with this Guidance Note.
Technical Expert (TE)	A person qualified and experienced in the operations of their company who has overall responsibility for ensuring competency of the technical staff and compliance with regulations.

GUIDANCE NOTE 25

GUIDANCE ON ASSESSING THE COMPETENCY OF PERSONNEL UNDERTAKING PERIODIC INSPECTION AND TESTING OF GAS CYLINDERS

1. INTRODUCTION

Gas cylinders contain large amounts of stored energy. It is vital that they are made to appropriate standards and are then regularly maintained to ensure the safety of those who transport, fill and use them.

The Carriage of Dangerous Goods and use of Transportable Pressure Equipment Regulations (4) implement the requirements of the European Transportable Pressure Equipment Directive (6) and the European Agreement concerning the International Carriage of Dangerous Goods (ADR) (7). The Regulations require that transportable gas cylinders are inspected and tested on a routine basis. This provides assurance that each cylinder is fit for purpose.

Where gas cylinders are used in a non-transport related application they come under the scope of the Pressure Equipment Regulations (3), which implement the European Pressure Equipment Directive (5).

Initial, and subsequently periodic inspection and testing, of transportable gas cylinders (unless they have an exemption from the regulations) can only be carried out by an inspection body authorised by the National Competent Authority. In the UK the Competent Authority is the Secretary of State for Transport, within the Department for Transport (DfT). DfT has set up a scheme to appointment inspection bodies in order to meet these obligations. The scheme is operated by the Vehicle Certification Agency (VCA) for the Dangerous Goods Office.

DfT has appointed the United Kingdom Accreditation Service (UKAS) as the delegated 'accreditation' body. Appointments are made by VCA following an assessment and, if appropriate, recommendation for the appointment by UKAS; successful applicants are issued an approval by the VCA defined by their individual Schedule of Accreditation.

Details of the inspection bodies who have been appointed to undertake various functions in connection with the inspection of tanks and/or pressure equipment are published on the VCA website. Further information on appointments can be obtained from the VCA.

This BCGA Guidance Note provides guidance on the expected levels of competency that would be required to meet industry best practice for persons carrying out periodic inspection and testing of gas cylinders. This document would be expected to be used as part of a documented quality system, it can also be used as part of a training programme and qualification process. In addition, this document may be used as a benchmark for assessors to accredit against.

2. SCOPE

The scope of this document is to:

- (i) Provide a consistent and fair process for gathering the required evidence to demonstrate competency of those personnel undertaking periodic inspection and retesting of gas cylinders.
- (ii) Provide guidance to assessors and auditors, including UKAS and companies seeking approval, on the methods of assessing competency with persons carrying out periodic inspection and retesting of gas cylinders safely.
- (iii) Provide a guide for organisations to ensure competent persons are providing safe products for a period of further use
- (iv) Be used as an audit tool as part of a documented quality system.
- (v) Be used to meet industry best practice as part of an assessment and training programme.
- (vi) Help ensure that staff who carry out inspections of gas cylinders are **ONLY** those who have the necessary training and competence.
- (vii) Support personnel with personal career record keeping and self-assessment.

Cylinder types covered includes seamless steel; welded steel; seamless aluminium alloy; hoop and composite wrapped composite, and dissolved acetylene.

This document excludes cylinder manufacturers during the process of cylinder manufacture.

3. GENERAL REQUIREMENTS

All staff should have the necessary skills and knowledge to carry out their job safely and shall receive appropriate information, instruction and training, including induction and continuation / refresher training. Such training shall be both theoretical and practical. It is the duty of the employer to ensure their persons are adequately trained and to establish competency.

It is recommended that a training programme is carried out under a formalised system where an acceptable level of competency has to be achieved. The programme shall make provision for periodic competence re-assessment.

Various regulations, documents and standards identify the need and the requirement for the documentation of competency in the workplace of personnel who undertake periodic inspection and retesting of gas cylinders.

Before first use of any equipment used for the periodic inspection and retesting of gas cylinders, personnel shall receive appropriate training in the safe use of the equipment and functions performed.

BCGA generally considers three years to be a reasonable timescale for competence re-assessment, but this period and the degree of re-assessment will depend on the individual concerned, their level of competence, their familiarity with the work and their frequency and use of the equipment. Such training may need to be periodically supplemented to take into account changes in regulations, practices or equipment.

Comprehensive Operator training and subsequent competency assessment does not have to be completed as a single event. Operators may undertake training for a discreet set of skills, then gain experience whilst working under supervision. Such a system would progressively allow an Operator to gain competency at the skill, and allow the Supervisor to determine the level of supervision required. This to be followed by assessment when both the Operator and Supervisor are satisfied that sufficient training has been achieved.

Full competency in all activities may not be appropriate for all Inspectors / Examiners and, in such cases, assessments can be split into individual competencies. Such an approach enables Operators to work without supervision within their established competence on limited tasks.

There should be a traceable line of technical knowledge, authority and competence at all stages from the Director to the Operator.

Under the Health and Safety at Work etc. Act (1), including its associated regulations, and the Carriage of Dangerous Goods and use of Transportable Pressure Equipment Regulations (4), all personnel who are involved in the inspection and testing of gas cylinders are required to be appropriately trained and knowledgeable in their responsibilities and duties to ensure their safety and the safety of those around them.

Under ADR (7), Chapter 1.3, personnel are required to be competent, and have general awareness, function specific and safety training appropriate to their responsibilities and duties.

Documentation is necessary to demonstrate compliance; the qualifications, training and assessment records should be recorded.

Under ADR (7) and the Provision and Use of Work Equipment Regulations (PUWER) (2) there is a general safety obligation for participants to take appropriate measures to avoid foreseeable dangers and minimise their effects.

The standard to which Inspection Bodies are assessed is ISO/IEC 17020 (8), *General criteria for the operation of various types of bodies performing inspection*. UKAS provides guidance for those requirements in ISO/IEC 17020 (8) which need interpretation. UKAS publications include:

- UKAS RG0 (9), *Guidelines on the competence of personnel undertaking engineering inspections*.
- UKAS RG2 (10), *Accreditation for in-service inspection of pressure systems / equipment*.
- UKAS RG3 (11), *Accreditation for in-service inspection of Transportable Pressure Receptacles (TPRs)*.

The European Industrial Gases Association (EIGA) Document 79 (19), *Cylinder retest stations*, provides information on testing cylinders and includes requirements that:

- Personnel involved in the retesting of gas cylinders shall be suitably qualified;
- There shall be a training scheme in place to ensure that all personnel are adequately trained for the tasks to be carried out;
- There shall be periodic competency checks of all personnel;
- Records on the training of personnel shall be maintained, including the competence level achieved.

4. THE PROCESS OF THE COMPETENCY ASSESSMENT

The assessment of the competency of the Inspector / Examiner and Operator may be gathered using a variety of procedures and techniques. It is the responsibility of the Director to ensure the chosen assessor and assessment methods are suitable.

The assessor should:

- Possess relevant, suitable and pertinent technical knowledge;
- Have experience in performance assessment;
- Have knowledge in the skill being assessed.

NOTE: If a suitably qualified person having the skill requirements is not available, it may be prudent to use a qualified assessor to gather all the required information. The report produced can be part of the assessment process and used by a designated member of management to make the professional judgements required for operator competency assessment.

It is important to the Operator, Inspector / Examiner and companies, that this process of competency assessment should be a positive, learning experience. This process aims to:

- (i) Enable the Operator and Inspector / Examiner to prove their competency;
- (ii) Recognise and record achievement and competence;
- (iii) Identify any areas which require further development and training to fulfil competence in the workplace;
- (iv) Provide opportunity for continued career development;
- (v) Maintain confidentiality between the company, assessor and the Inspector / Examiner.

Chart 1 shows a flowchart detailing the typical process to be followed.

Table 1 (refer to Appendix 1) shows a Competency Assessment Plan that identifies a staged plan for the competency assessment. Typical attendees are shown.

The completion of the activities in Table 1 helps to ensure compliance with competency assessment principles and that plans are Specific, Measurable, Achievable, Realistic and Time bound, (SMART).

This competency assessment schedule should be:

- Shared with the participants in advance;
- Adjusted according to individual job responsibilities;
- Agreed with the participants prior to the assessment.

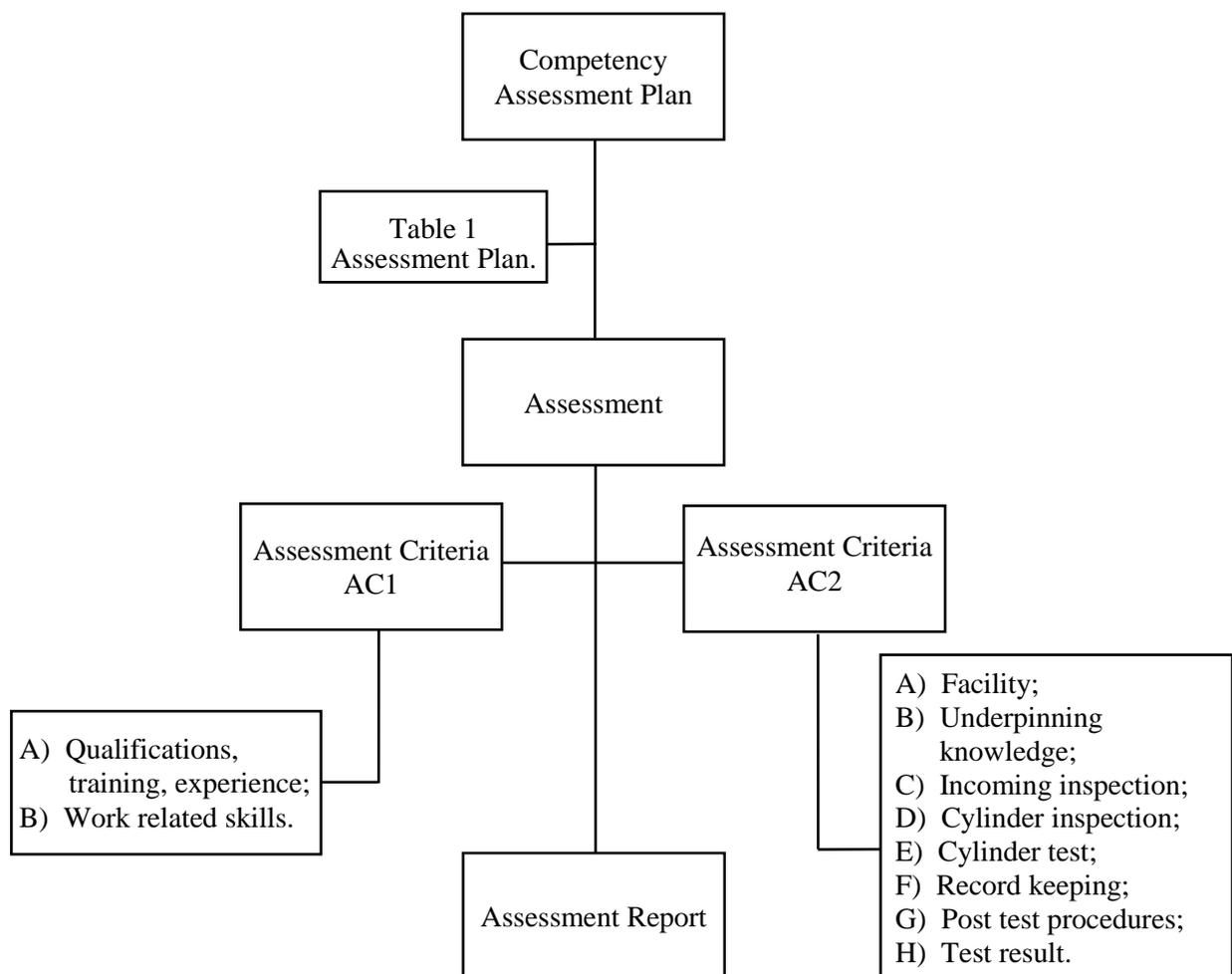


Chart 1: Process flowchart

Before the start of the assessment the concerns that the candidate may have should be considered. The candidate should be briefed on the nature of the process and asked if they have any questions or concerns regarding the assessment. Any issues should be addressed

before starting the assessment. The assessor should explain the duration, the method and what happens on completion. If unsuccessful further coaching should be arranged, as appropriate.

The following actions should be carried out on completion of the assessment:

- (i) Feedback given to the candidate should be:
 - Specific;
 - Constructive;
 - Impartial (not personal);
 - Balanced – highlight positive and negative aspects.
- (ii) The candidate's opinion of their assessment performance should be asked.
- (iii) The assessor should point out where they were correct and give encouragement.
- (iv) The assessor should indicate their weaknesses and provide correct answers.
- (v) The assessor should discuss the outcome, and go through the Assessment Standard to provide specific feedback.
- (vi) The assessor should answer any questions.
- (vii) The assessor should inform them what happens next.
- (viii) The assessor should, if they passed the assessment, inform the candidate that they are considered competent to perform the task.
- (ix) If the candidate has not passed the assessment, advise that their Supervisor will be informed and, as appropriate, arrangements made for further coaching / practice and re-assessment.

4.1 Assessment Criteria

The assessment is undertaken against the following suggested Assessment Criteria (AC):

AC 1 is an initial assessment typically undertaken during recruitment and job interview. AC 1 has two sub-sections. These sub-sections are detailed in Appendix 2.

- A Qualifications, training, experience;
- B Work related skills.

This evidence does not need to be gathered in subsequent assessments unless there is a significant change.

NOTES:

- (1) Review at future assessments, if appropriate.
- (2) Training, authorisation and assessments should be recorded in the individuals' personnel records along with copies of certificates and supporting evidence.
- (3) Training needs to be identified with a re-assessment interval, as part of continued career development.
- (4) All relevant signatures.
- (5) Identification of competent persons and individual competencies, including final sign-off certifying competency judgement.

AC 2 is a review of day-to-day job related activities and may include a review of AC 1 if there have been changes. AC 2 has eight sub-sections. These sub-sections are detailed in Appendix 3.

- A Facility;
- B Underpinning knowledge;
- C Incoming inspection;
- D Cylinder inspection;
- E Cylinder test;
- F Record keeping;
- G Post test procedures;
- H Test result.

4.2 Evidence

Evidence should be obtained so that it is valid, current, auditable and sufficient.

Assessment Criteria checklists AC 1 and AC 2 provide suggestions where sources of evidence may be located.

AC 1 and AC 2 provide specific questions which may be used to collect evidence from the Operator and the Inspector / Examiner.

Evidence should be recorded in the appropriate boxes of the assessment criteria checklists.

Additional evidence may be recorded (scanned) and filed in appendices, referenced in each box.

4.3 Competency judgements

Competency judgements are made from the evidence collected in Section 4.2.

Supported by Table 2 - Dependence Indicators. Refer to Appendix 1.

4.4 Final Report

After due consideration of all the evidence, the Assessor shall complete and issue a signed final report with competency judgements. Judgements may be made by the Assessor alone or by collaborative discussion with the designated Technical Expert.

It shall include:

- The Competency Assessment Plan;
- Assessment Criteria AC 1 and AC 2;
- All evidence.
- Recommended supervision / rectification requirements if an Operator or Inspector / Examiner is not fully competent.
- Next assessment date.

The final report is a confidential document presented to company management, and should only be disclosed to persons legitimately requiring the information. The report should be kept as evidence of a continuous improvement process and reviewed at appropriate timescales and no longer than 12 monthly.

5. REFERENCES

Document Number	Title
1.	Health and Safety at Work etc. Act, 1974
2. SI 1998 No. 2306	Provision and Use of Work Equipment Regulations (PUWER).
3. SI 1999 No. 2001	The Pressure Equipment Regulations 1999 (as amended).
4. SI 2009 No. 1348	Carriage of Dangerous Goods and use of Transportable Pressure Equipment Regulations 2009 (as amended).
5. Directive 97/23/EC	Directive 97/23/EC of the European Parliament and of the Council of 29 May 1997 on the approximation of the laws of the Member States concerning pressure equipment.
6. Directive 2010/35/EU	Directive 2010/35/EU of the European Parliament and of the Council of 16 June 2010 on transportable pressure equipment
7. ECE/TRANS/242	European Agreement concerning the International Carriage of Dangerous Goods by Road (ADR).
8. ISO / IEC 17020	General criteria for the operation of various types of bodies performing inspection.
9. UKAS RG0	Guidelines on the competence of personnel undertaking engineering inspections.
10. UKAS RG2	Accreditation for in-service inspection of pressure systems / equipment.
11. UKAS RG3	Accreditation for In-Service Inspection of Transportable Pressure Receptacles (TPRs).
12. BS EN 837	Pressure gauges.
13. BS EN 1089 Part 3	Transportable gas cylinders. Gas cylinder identification (excluding LPG). Colour coding.
14. BS EN 1802	Transportable gas cylinders. Periodic inspection and testing of seamless aluminium alloy gas cylinders.
15. BS EN 1803	Transportable gas cylinders. Periodic inspection and testing of welded carbon steel gas cylinders.
16. BS EN 1919	Transportable gas cylinders. Cylinders for liquefied gases (excluding acetylene and LPG). Inspection at time of filling.
17. BS EN 1968	Transportable gas cylinders. Periodic inspection and testing of seamless steel gas cylinders.

Document Number	Title
18. BS EN ISO 11623	Transportable gas cylinders. Periodic inspection and testing of composite gas cylinders.
19. EIGA IGC Document 79	Cylinder retest stations.
20. BCGA Technical Information Sheet 6	Cylinder identification. Colour coding and labelling requirements.

Further information can be obtained from:

UK Legislation	www.legislation.gov.uk
Health and Safety Executive	www.hse.gov.uk
British Standards Institute (BSI)	www.bsigroup.co.uk
International Organization for Standardization (ISO)	www.iso.org
European Industrial Gases Association (EIGA)	www.eiga.eu
British Compressed Gases Association (BCGA)	www.bcgaco.uk
Department for Transport (DfT)	www.dft.gov.uk
United Kingdom Accreditation Service (UKAS)	www.ukas.com
Vehicle Certification Agency (VCA)	www.dft.gov.uk/vca

TABLE 1: COMPETENCY ASSESSMENT PLAN

1	2	3	4
Persons involved	Agreed Actions	Assessment methods used	Agreed Date / Time of action
O, A, I/E, TE, D	Introductory explanation by A of the aims of the assessment process.	Recognition of Prior Learning (RPL)	
O, A, I/E, TE, D	Review and adjust where appropriate: AC 1 (Appendix 2). Skills, knowledge and understanding. AC 2 (Appendix 2). Inspection and retesting of cylinders.	Personal statements Observation Examination of work products	
A, I/E, D	Agree and highlight the evidential methods of the assessment process. <i>(Listed in Column 3).</i> Identify assessment standard(s) used.	Oral questioning Discussion Written questioning	
A, I/E, O	Agree collection date of AC 1 (Appendix 2). Range of scope of activities to be assessed. Skills, knowledge and understanding.	Witness verification/ statements	
A, I/E, O	Agree date for completion of AC 2 (Appendix 2). Inspection and retesting of cylinders.	Video, oral, photographic records	
A, (I/E)	Report by A to be completed with competency judgements made with / without designated TE input as appropriate. Report to include all evidence gathered to support checklists and identified training needs.	Assignments/ Projects / Case scenarios Skills	
A, I/E, O	Feedback to O. Opportunity for O to provide additional comments, and information to include personal career aspirations. All contributions to be recorded and included in the final report.		
A, TE, D	Assessor report feedback to TE and sign off of training needs.		

Key:

A – Assessor

O – Operator

D – Director

I/E – Inspector/Examiner

TE – Technical Expert

TABLE 2: DEPENDENCE INDICATORS

Grade	Performance Criteria	Quality of Performance	Assistance Required
1. Independent	Level of practice is of a high and safe standard.	<ul style="list-style-type: none"> • Sound level of theoretical knowledge applied effectively. • Coordinated and adaptable when performing skills. • Achieves intended purpose. • Proficient and performs within expected time frame. • Initiates actions independently and / in cooperation with others to ensure safe delivery. 	No supporting cues needed.
2. Supervised	Level of practice is of a safe standard but with some areas of improvement required.	<ul style="list-style-type: none"> • Correlates theoretical knowledge to practice most of the time. • Coordinated and adaptable when skills performed. • Achieves intended purpose. • Performs within a reasonable time frame. • Initiates actions independently most of the time and / in cooperation with others to ensure safe delivery. 	Requires occasional supportive cues.
3. Assisted	Level of practice is of a safe standard but with many areas of improvement required.	<ul style="list-style-type: none"> • Demonstrates limited correlation of theoretical knowledge to practice. • At times lacks coordination when performing skills. • Achieves intended purpose most times but needs occasional prompt. • Performs within a delayed time period. • Lacks initiative and foresight. 	Requires frequent supportive cues and direction.
4. Dependent	Level of practice is unsafe if left unsupervised.	<ul style="list-style-type: none"> • Unable to correlate theoretical knowledge to practice. • Lacks coordination when performing skills. • Unable to achieve intended purpose without prompt. • Unable to perform within a delayed time period. • No initiative or foresight. 	Requires continuous supervision and direction.

ASSESSMENT CRITERIA – AC 1

Sub-Section A: Qualifications, training, experience.

Criteria area of competence	Description	Success criteria / evidence source	Typical questions	Assessment method	Evidence (numbered reference) / comments
General education/ Qualifications	Secondary including maths and English. University / College.	Detailed CV. Personal statement. Qualifications & certificates.	Did you achieve any attainment qualifications at school? Did you go into further education?	Witness verification. Discussion. Personal statement.	
Personal attributes	Communication skills. Visual acuity. Written skill. Problem solving. Decision making.	Able to communicate and be understood. Eyesight tests / use of glasses. Able to write clearly. Understands significance of checks.		Witness verification. Discussion.	
Experience	Minimum 2 years.	Detailed CV. Personal statement. Generic log for CPD. References.	Briefly describe your previous places of work and your roles within them.	Witness verification. Discussion. Personal statement.	

APPENDIX 2

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Criteria area of competence	Description	Success criteria / evidence source	Typical questions	Assessment method	Evidence (numbered reference) / comments
Current role / responsibility	Job description as in work contract.	Detailed job description. Personal statement. Generic log for CPD.	What does your current workplace do? What are your roles & responsibilities? Who do you report to?	Witness verification. Discussion.	
Training	In relevant engineering field (Necessity in all areas within the plant 1x week per job).	Training competence records / certificates / Operator skill matrix/ competencies defined (including limitations).	What training have you had? Do you and your workplace keep training records? Are there any areas that you feel you require further training?	Witness verification. Management.	

ASSESSMENT CRITERIA – AC 1

Sub-Section B: Work related skills.

Area of Competence	Description	Success criteria / Evidence Source	Typical questions	Assessment Method	Evidence (numbered reference) / Comments	Dependence indicator (1 to 4) ^{NOTE}
Organisation	Ability to operate within company hierarchy, culture & reporting structures.	Organisation of workload. Work Tables/ schedules. Time management efficiency.	How do you plan your workload? Are there routines that are adhered to? Are there opportunities for improving your time management efficiency?	Witness/ Management verification		
IT skills & administration (if appropriate)	Ability to use a computer to accurately document data, measurements, inspection results and tests.	Demonstrated ability- Data capture and communication methods.	How do you capture and retrieve data? Are there document formats used for data communication? What are your methods of record keeping?	Observation		

APPENDIX 2

Sheet 4 of 4

Area of competence	Description	Success criteria / Evidence source	Typical questions	Assessment Method	Evidence (numbered reference) / Comments	Dependence indicator (1 to 4) ^{NOTE}
Self-assessment	Recognise ability limitations and act accordingly	Demonstrate ability. Strengths & weaknesses. Seek support. Know source for information	Do you regard yourself as a contributor in the workplace? What are your strengths? Have you any areas you feel that need further development?	Observation Interview/ discussion Witness verification		

NOTE: The Dependence Indicators (refer to Appendix 1, Table 2) are: (1) Independent, (2) Supervised, (3) Assisted, (4) Dependent.

ASSESSMENT CRITERIA – AC 2

Sub-Section A: Facility

Area of competence	Description	Success criteria / Evidence source	Questions	Evidence (numbered reference) / Comments
Lighting	Adequate	Does not inhibit inspections.		
Calibration	Equipment calibrated	Within calibration dates. Calibration logs present.		
Testing equipment	Regular maintenance and checking	Regularity of Company maintenance procedures with records. Procedure documentation.	What action would you take if equipment fails / looks defective?	
Personal Protective Equipment (PPE)	Suitable PPE used including feet, hands, eyes, body protection.	Procedure documentation in place and implemented.	What PPE do you use within your roles and responsibilities?	

ASSESSMENT CRITERIA – AC 2

Sub-Section B: Underpinning knowledge

Area of Competence	Description	Success criteria / Evidence Source	Questions	Evidence (numbered reference) / Comments	Dependence indicator (1 to 4) ^{NOTE}
Training plan	Review of ongoing training				
Gas cylinders	Manufacture / properties	Manual for reference. Knowledge of range of gas cylinders.	What cylinders do you inspect? Are there any specific/ additional considerations when inspecting/ testing these cylinders? Are there other cylinder types?		
	Seamless steel cylinders BS EN 1968 (17)	Most commonly used high pressure gas cylinders			
	Aluminium cylinders BS EN 1802 (14)	Heat treated alloys Understands temperature limits. Potential for neck cracks. Lower torque for fitting valves. Cleaning solvent compatibility.			

APPENDIX 3

Sheet 3 of 10

Area of Competence	Description	Success criteria / Evidence Source	Questions	Evidence (numbered reference) / Comments	Dependence indicator (1 to 4) <small>NOTE</small>
	Welded steel cylinders BS EN 1803 (15)	Does not apply to acetylene. Proof test only. Inspect foot ring and water entrapment areas. Check welds.			
	Composite cylinders BS EN ISO 11623 (18)	Use manufacturer's recommendations Shorter retest interval. Life limited Heat limits e.g. 70 °C for 24 hrs. Can be repaired if minor damage. Check for neck cracks. Do not stamp –use labels.			
	Valves	Variety			
	Transport/ Handling	Health & Safety	Do you know the regulations governing gas cylinder transportation?		

NOTE: The Dependence Indicators (refer to Appendix 1, Table 2) are: (1) Independent, (2) Supervised, (3) Assisted, (4) Dependent.

ASSESSMENT CRITERIA – AC 2

Sub-Section C: Incoming inspection

Area of Competence	Description	Success criteria / Evidence Source	Questions	Evidence (numbered reference) / Comments	Dependence indicator (1 to 4) ^{NOTE}
Identification and segregation of cylinders for periodic inspection and testing	Parameters and procedures guiding selection and segregation	<p>Procedure document.</p> <p>Knowledge of:</p> <ul style="list-style-type: none"> • cylinder owner; • history; • markings, label, colours, date rings; • manufacturing activity; • inspection interval/ frequency/ regulations; • identification of gas types e.g. liquefied, compressed, flammable, inert, toxic; • knowledge of gas properties. <p>H&S protocols adhered to i.e. no free standing cylinders, churning, trolley, forklift transportation.</p>	<p>Is there a company procedure in place?</p> <p>Where is it kept/ displayed?</p> <p>Who does the cylinder selection?</p> <p>What do you need to know about the cylinder?</p> <p>Why?</p> <p>What are the regulations for gas cylinder inspection?</p> <p>Where are the selected cylinders stored?</p> <p>How are they handled?</p> <p>Are there H&S procedures?</p> <p>Are they implemented?</p>		

NOTE: The Dependence Indicators (refer to Appendix 1, Table 2) are: (1) Independent, (2) Supervised, (3) Assisted, (4) Dependent.

ASSESSMENT CRITERIA – AC 2

Sub-Section D: Cylinder inspection

Area of Competence	Description	Success criteria / Evidence Source	Questions	Evidence (numbered reference) / Comments	Dependence indicator (1 to 4) ^{NOTE}
Venting and degassing	Gases vented safely. Protection against accidental de-valving when pressurised.	Low risk. Dangerous substances controlled safely. Whisper test and blocked valve checks. RPV identification and removal.			
De-valving	Does not damage valve or cylinder. Cylinder security.	Grips adjustable. Safety cages.	What are the adjustments for different cylinder types? How do you know if the cylinder is fully depressurised? How do you remove RPV's?		
Cleaning	Sufficient purging. Internal and external cleaning. Paint removal method.	Knowledge of appropriate cleaning chemicals and their effect on cylinders and valves.	How are hazardous gases checked prior to removal? How is paint removed? What temperatures are used? Are grinders used?		

APPENDIX 3

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Area of Competence	Description	Success criteria / Evidence Source	Questions	Evidence (numbered reference) / Comments	Dependence indicator (1 to 4)^{NOTE}
Valve overhaul / replacement	Methods.	Requirement for dip tubes.			
Tare weight	Scale adequate to accommodate cylinders.	Tare weight checks / corrections. Scale calibrated. BS EN 1919 (16)	Weight limits? Action if underweight?		
Visual external inspection	Defect identification.	Tools available. Knowledge of defect types and rejection criteria.	What criteria are used? What are corrosion limits? Action if unsure?		
Visual internal inspection	Thread gauges. Use of inspection tools	Tools available. Inspection light sufficient. Light type for flammable products. Gauges calibrated.			
Repainting		Knowledge of paint types and fume extraction, as relevant.	What colour to use?		
Thread inspection	Thread gauges. Use of inspection tools.	Inspection light sufficient. Light type for flammable products. Gauges calibrated.			
Valve guard	Correct fitting				

NOTE: The Dependence Indicators (refer to Appendix 1, Table 2) are: (1) Independent, (2) Supervised, (3) Assisted, (4) Dependent.

ASSESSMENT CRITERIA – AC 2

Sub-Section E: Cylinder test

Area of Competence	Description	Success criteria / Evidence Source	Questions	Evidence (numbered reference) / Comments	Dependence indicator (1 to 4) ^{NOTE}
Hydraulic Test	Connection of test connection	Company procedure in place and adhered to. Start up procedure known.			
	Calibration	Gauges used e.g. BS EN 837 (12) compliance to standards.			
	Test procedure	Knowledge of Company procedure which is in place.			
Filling	Fluid used.	Water filling and 6061 aluminium alloy, 2 hour limit. Recycling -removal of contaminants. PH checks. Filtration.			
	Pressure safety	System design adequate. Over pressure protection method. Equipment failure modes identified.			

NOTE: The Dependence Indicators (refer to Appendix 1, Table 2) are: (1) Independent, (2) Supervised, (3) Assisted, (4) Dependent.

ASSESSMENT CRITERIA – AC 2

Sub-Section F: Record keeping

Area of Competence	Description	Success criteria / Evidence Source	Questions	Evidence (numbered reference) / Comments	Dependence indicator (1 to 4) <small>NOTE</small>
Test records	Use of test log	Data capture procedure. Consistent proforma usage. Accurate test record. In accordance with standards			

NOTE: The Dependence Indicators (refer to Appendix 1, Table 2) are: (1) Independent, (2) Supervised, (3) Assisted, (4) Dependent.

ASSESSMENT CRITERIA – AC 2

Sub-Section G: Post test procedures.

Area of Competence	Description	Success criteria / Evidence Source	Questions	Evidence (numbered reference) / Comments	Dependence indicator (1 to 4) ^{NOTE}
Drying	Method does not overheat	Check methods used. Time and temperature limits.	Heat limits for different cylinder types		
Visual Inspection	Final check tools and method	Dry, no free moisture.	Action if water present		
Re-valving	Suitable equipment	Torque wrench calibration. Correct torque used. Knowledge of PTFE taping.	Do you check the calibration?		
Marking	Stamp legible and correct	Stamp size correct. Composite use of labels			
Painting	Appropriate equipment	Correct colour codes BS EN 1089-3 (13) & BCGA TIS 6 (20)			

NOTE: The Dependence Indicators (refer to Appendix 1, Table 2) are: (1) Independent, (2) Supervised, (3) Assisted, (4) Dependent.

ASSESSMENT CRITERIA – AC 2

Sub-Section H: Test result

Area of Competence	Description	Success criteria / Evidence Source	Questions	Evidence (numbered reference) / Comments	Dependence indicator (1 to 4) ^{NOTE}
Return to service	Suitable for next service period.	Cylinders not mixed with unserviceable cylinders.			
Defect acceptance	<p>Knowledge of defect types.</p> <p>Use of equipment.</p> <p>Able to determine limits of acceptance.</p>	<p>Use of regulations / company procedures as a guide.</p> <p>Proficient with equipment.</p> <p>Can identify regulations relevant to checks performed and use pass / fail criteria.</p> <p>Knowledge of checks histories dates.</p> <p>Knowledge of actions on equipment defects.</p>	<p>Can you show me the regulation for ...?</p> <p>What is the acceptable corrosion limit for ...?</p> <p>What action would you take if equipment fails / looks defective?</p> <p>Are there procedures in place for implementation of these actions?</p> <p>Identify a failure.</p>		
Render unserviceable	Unable to be put back into service	<p>Permanently destroyed.</p> <p>Methods include cutting, thread destruction, holes.</p>			

NOTE: The Dependence Indicators (refer to Appendix 1, Table 2) are: (1) Independent, (2) Supervised, (3) Assisted, (4) Dependent.



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