



CODE OF PRACTICE 48

**THE SAFE FILLING OF THIRD-PARTY
OWNED AND / OR MAINTAINED TANKS**

2020

British Compressed Gases Association

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2020

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www.bcga.co.uk

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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 promote safe practice and to prioritise environmental protection in the supply, use, storage, transportation and handling 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.

This document has been prepared by BCGA Technical Sub-Committee 1. This document replaces BCGA Guidance Note 17, Revision 2, 2013. It was approved for publication at BCGA Technical Committee 162. This document was first published on 07/08/2020. For comments on this document contact the Association via the website www.bcgaco.uk.

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* Throughout this publication the numbers in [] brackets refer to references in Section 6. Documents referenced are the edition current at the time of publication, unless otherwise stated.

TERMINOLOGY AND DEFINITIONS

Gas supplier	The Gas Supplier is the organisation that supplies gas for a third party owned tank under a contract arrangement.
Gas supplier's technical person	A suitably qualified engineer with experience of pressure systems, including a technical knowledge of gas storage systems, associated equipment and filling methods, appointed by the Gas Supplier to assess the safety of each tank and to establish a safe method of filling the tank.
May	Indicates an option available to the user of this Code of Practice.
Shall	Indicates a mandatory requirement for compliance with this Code of Practice and may also indicate a mandatory requirement within UK law.
Should	Indicates a preferred requirement but is not mandatory for compliance with this Code of Practice.
Tank	<p>The complete storage vessel, its accessories and any integral equipment such as refrigeration unit or pressure build vaporiser(s) and fill lines.</p> <p>It does not include the site distribution pipework or ancillary process equipment.</p>
Tank owner	The person or organisation that owns the tank.
Third party	For the purpose of this document a third party is any organisation other than the Gas Supplier.
User	The person or organisation who uses the tank to supply the gas it contains for their process. The tank will be sited on the User's premises. The User may also be the Tank Owner.
Competent person	A competent individual person (other than an employee) or a competent body of persons corporate or unincorporated, as defined in the <i>Pressure Systems Safety Regulations (PSSR)</i> ^[3] .

CODE OF PRACTICE 48

THE SAFE FILLING OF THIRD-PARTY OWNED AND / OR MAINTAINED TANKS

1. INTRODUCTION

All gases are classified as hazardous and, when stored in bulk, they shall be kept in storage tanks which are specifically designed to safely contain and manage the product being stored, taking account of the particular properties of the individual gas.

To provide a local bulk gas source it is usual for a storage tank to be installed on the site where the gas is to be used. This storage tank may be owned by the User, or it may be provided under a contract arrangement with a tank / equipment supplier. The storage tank will usually be filled under a contract arrangement with a Gas Supplier.

All parties involved in the filling of a storage tank (including the User, the Tank Owner and the Gas Supplier) have obligations to minimise the risks from the operation of filling storage tanks at the User site(s). A tank shall not be filled until it has been established that it is safe.

Refer to BCGA Leaflet 12 ^[11] *Liquid gas storage tanks – Your responsibilities*, in support of this Code of Practice. It is a simple user guide that advises Users and owners of liquid gas storage tanks on their responsibilities and duty of care to ensure that the equipment is maintained and operated safely.

The User should ensure that they have adequate insurance to cover their activities and that they use their gases and look after their gas tanks and associated equipment in a safe and responsible way.

2. SCOPE

This document details the tank User's, the Tank Owner's and the Gas Supplier's responsibilities when intending to fill a third-party owned tank, used for the storage of refrigerated liquefied gases.

3. RESPONSIBILITIES FOR SAFE FILLING

Each storage tank shall be installed in accordance with industry best practice, this includes:

- carbon dioxide tanks, BCGA CP 26 ^[5], *Bulk liquid carbon dioxide storage at Users' premises*.
- liquid oxygen, nitrogen and argon tanks, BCGA CP 36 ^[6], *Cryogenic liquid storage at Users' premises*.

- hydrogen, liquefied natural gas (LNG) tanks, BCGA CP 46 ^[9], *The storage of cryogenic flammable liquids*.

There are obligations for all parties involved in the filling of a tank. These parties are principally the User, the Tank Owner and the Gas Supplier.

For the User, refer to Section 3.1;

For the Tank Owner, refer to Section 3.2;

For the Gas Supplier, refer to Section 3.3.

3.1 Responsibilities for the User

The User shall appoint a designated person who has responsibility for the safe use of the tank, including all filling activities. This person will be the point of contact between the User and the Gas Supplier.

The User shall ensure the tank is safe to fill, including:

- that the Tank Owner is informed of the intended gas and the operating limits of the application;
- that the tank is designed for the gas it will contain. There are specific requirements required to be carried out if a change of gas service is proposed, which may not always be possible in its current location. The User shall consult with and obtain permission from the Tank Owner before any change of gas service;
- that the tank is identified with a data plate, refer to Section 3.2;
- that the tank is marked and labelled with the gas it contains;
- that the tank level and pressure devices are of a suitable design and range, are operating correctly and are maintained to allow safe filling;
- that the tank is fitted with appropriate safety devices;
- that the tank is operated, inspected and maintained in accordance with the manufacturers' instructions, taking account of local environmental conditions. Standard operating procedures are established and documented;
- compliance with relevant legislation, such as the *Pressure Systems Safety Regulations (PSSR)* ^[3];
- that the tank is not modified or repaired in such a way as to give rise to danger, impair the operation of any protective device or the ability to inspect and maintain the tank, refer to BCGA CP 39 ^[7], *In-service requirements of pressure equipment (gas storage and distribution systems)*;

- through agreement with the Tank Owner that tanks are revalidated, in accordance with BCGA CP 39 ^[7], and any changes required are implemented;
- that the service history of the tank is known and any previous contents will be compatible with the product to be filled, for example, if for oxygen service, the tank has not been contaminated with any substance which could give rise to danger;
- that the filling location and the tank installation comply with relevant current industry best practice documents, including relevant separation distances, such as BCGA CP 26 ^[5], CP 36 ^[6], CP 46 ^[9] and CP 39 ^[7];
- Where the User is not the owner of the tank, that they have the Tank Owner's documented permission for the tank to be filled;
- that a safe method of filling the tank is established and agreed with the Gas Supplier;
- that the Gas Supplier is advised of any changes (i.e. changes made from the design previously accepted by the Gas Supplier) to the associated equipment and infrastructure or process conditions which may affect the safe filling of a tank;
- specifically for carbon dioxide service, compliance with BCGA CP 42 ^[8], *Implementation of EIGA carbon dioxide standards*;
- that any ancillary equipment provided is compatible with the intended gas product and process and does not give rise to danger;
- that all ancillary equipment is maintained in a safe condition. All connected pipework is of a suitable design and is safe to allow filling. Filling connections are appropriate for the gas product within the tank. Refer to BCGA CP 4 ^[4], *Gas supply and distribution systems (excluding acetylene)*;
- that they do not install any infrastructure or introduce any other hazardous material into the vicinity of the tank that may encroach on the installation or give rise to danger;
- that when the gas supply delivery vehicles are on-site User's shall:
 - ensure safe access and egress for the delivery vehicle at all times the vehicle is in attendance;
 - ensure the vehicle is able to park next to the filling connections on a foundation of suitable integrity;
 - ensure that the vehicle can be positioned such that the Gas Supplier's operator can clearly view the tank controls (for example, gauge faces) during the fill, whilst stood at the vehicle pressure system controls;

- be protected from any other local hazards that may be present;
 - have safe access and egress for the vehicle crew at all times to safely carry out their duties, as well as to rapidly exit the area in the event of an incident.
- that the tank, associated equipment and the installation are subject to routine daily checks. These to include checks for correct operation of valves, the general condition of the tank and the associated equipment. Records detailing the completed checks are to be maintained by the User, noting any operational problems encountered and recording these in the technical file with details of the corrective action undertaken.

Reference should be made to:

- BCGA Leaflet 11 ^[10], *Safety checks for cryogenic tanks*.
 - BCGA Leaflet 12 ^[11].
- that the installation is subject to regular housekeeping, keeping the area free of debris and any other items which do not belong in the installation;
 - emergency operating procedures are established and documented.

The User is responsible for resolving any safety issue or compliance shortfall as advised, or that is required by the Gas Supplier.

Appendix A provides a list of suggested checks to be performed ready for the first fill of a tank (in a suitable format). Additional checks may be appropriate for specific installations.

NOTES:

1. The Gas Supplier has a duty of care to the User as well as their own employees (driver / filler) to ensure the tank can be safely filled. The Gas Supplier shall conduct a visual inspection and a safety and technical risk assessment. The technical risk assessment will require information and documentation about the tank to be supplied by the User (the User may need to obtain this information from the Tank Owner).
2. If the User changes their Gas Supplier, it is to be expected that the new Gas Supplier will carry out a safety and technical risk assessment of the tank ensure that it is safe to fill the tank. The risk assessment will take into account the latest legislation and industry best practice documents.
3. The Gas Supplier may request written evidence of any of the above.

In the event that a Gas Supplier finds that a tank is unsafe to fill, refer to Section 4.

3.2 Responsibilities for the Tank Owner

The Tank Owner shall ensure on handover to the User:

- that the tank is suitable and of an appropriate design for the specified purpose, including suitability for the gas which the User will store in it;
- that the tank complied with suitable design codes (at time of manufacture);
- that the tank has a data plate clearly visible and permanently attached to the tank in accordance with the PSSR ^[3]. The information on the data plate shall include:
 - the manufacturer's name;
 - a serial number to identify the vessel;
 - the date of manufacture of the vessel;
 - the standard to which the vessel was built, or type approval mark;
 - the maximum allowable pressure of the vessel;
 - the minimum allowable pressure of the vessel where it is other than atmospheric;
 - the design temperature.
- that the tank is compatible with the operating limits specified for the User's application;
- that the tank is fitted with level and pressure devices suitable to allow safe filling;
- that the tank is fitted with appropriate safety devices;
- that any modification or repair to the tank complies with the requirements of relevant design codes and BCGA CP 39 ^[7];
- tanks are revalidated as required in accordance with BCGA CP 39 ^[7];
- operating and maintenance instructions are provided to the User, to allow safe use and operation.

3.3 Responsibilities for the Gas Supplier

Before a Gas Supplier's initial fill of a tank with any product, that Gas Supplier shall carry out a safety and technical risk assessment of the tank to ensure that the tank is safe to fill and that those filling the tank will be safe.

The Gas Supplier may undertake additional checks, prior to first fill or as they deem reasonable, to ensure that the tank remains safe to fill throughout the period of supply.

Before a tank is filled the Gas Supplier shall ensure that:

- they have the User's permission to fill the tank, and where applicable, the User provides evidence that they have the Tank Owners permission;
- the tank is in a safe condition to fill, including that:
 - the tank has suitable safety relief devices installed;
 - level and pressure devices are operational to allow safe filling;
 - there is adequate pressure protection during filling, taking into consideration tanker pump discharge characteristics;
- the tank is correctly identified with a data plate, refer to Section 3.2;
- the tank is marked and labelled with the product with which it is to be filled;
- the delivery vehicle has suitable access, egress and hard-standing in suitable proximity to the filling connections for each tank;

NOTE: The Gas Supplier has responsibility for the safe operation of the delivery vehicle and its associated equipment, as well as the safety of the vehicle crew.

- as required, they establish and agree with the User written procedures for the safe filling of the tank;
- they establish and agree with the User a process for notifying the Gas Supplier of changes to the tank, any associated equipment and the installation or its service which is relevant to the tank being filled.

For tanks in carbon dioxide service the Gas Supplier shall inspect and assess compliance with BCGA CP 42 ^[8], and routinely audit the site for compliance.

The Gas Supplier shall establish a documented procedure that defines:

- the process to be followed, including roles and responsibilities;
- the checks to be performed;
- the approval mechanism that the tank is safe to fill;
- the documentation to be maintained;
- the steps to be taken if the tank is unsuitable or unsafe for filling, refer to Section 4.

A list of suggested checks to be performed and a suitable format is given in Appendix 1. Additional checks may be appropriate for specific installations.

The Gas Supplier shall obtain from the User sufficient documentary evidence to establish that the tank is safe to fill.

At each fill of the tank the filler (vehicle driver / crew) shall carry out pre-fill and post-fill checks of the tank sufficient to ensure that the tank is safe to fill, is filled safely and that those filling the tank are safe.

The Gas Supplier should periodically renew their approval to fill a tank.

If the Gas Supplier becomes aware that there is either a safety or a compliance shortfall, the Gas Supplier shall take immediate action to:

- were so merited (for example, in the case of immediate danger), abort or suspend fills;
- inform the User (to allow them the opportunity to make it safe or bring it into compliance);
- notify the Gas Supplier's technical person.
- in the event of suspected contamination of a carbon dioxide tank, suspend deliveries immediately. Refer to BCGA CP 42 ^[8] and Section 4;

If a Gas Supplier believes a tank is unsafe to fill, deliveries shall be suspended, refer to Section 4.

4. PROCEDURES TO FOLLOW IF A TANK IS ASSESSED AS UNSAFE TO FILL

Whilst BCGA Codes are not retrospective, the User shall ensure the tank remains safe to fill; this may require a periodic review of the safety, condition, technical capability and legal compliance for each tank, its associated equipment and infrastructure.

If a Gas Supplier believes a tank is unsafe to fill they shall:

- refuse to fill the tank;
- advise the User of their concern;
- suspend future deliveries until the tank is safe to fill.

If the User intends to continue to use the tank (and therefore require the tank to be filled) the User shall rectify any safety issue(s) identified. The User shall seek agreement from the Tank Owner for any work required to rectify the safety issue.

Where there is only a minor concern(s) the Gas Supplier may decide to continue to fill the tank, allowing the User reasonable time to carry out rectification. This period shall also serve as a notice of suspension such that failure by the User to take appropriate action is cause to stop filling.

If a Gas Supplier believes a tank is unsafe to fill because they have identified a safety issue that would not be evident to another Gas Supplier (during their safety and technical assessment before their initial fill of the tank with a product), for example, an overpressure event, the Gas Supplier shall:

- advise the User of the immediate actions to take to make the tank safe;
- advise the User of the subsequent steps to take the tank out of service;
- complete and submit the BCGA Report Form A (refer to Appendix 2).

This form should be completed by the Gas Suppliers' technical person. The form should be completed as soon as practical, but within a maximum timescale of seven working days of the safety issue being identified. A copy shall be supplied to:

- the User;
- the BCGA (for the attention of the Chief Executive & Technical Manager).

BCGA contact information:

British Compressed Gases Association
4a Mallard Way
Pride Park
Derby
DE24 8GX
Email: admin@bcga.co.uk

BCGA will take the following actions:

1. On receipt of the form, BCGA will contact the User to confirm that they are aware of the safety issue, to ascertain if they agree with the findings of the Gas Supplier and to determine if the User is implementing corrective measures.
2. The BCGA will simultaneously communicate to other Gas Suppliers that this is an unsafe tank to fill.
3. Inform the Health & Safety Executive (HSE), as appropriate.

The BCGA may further engage with the User to offer advice, as appropriate, with the aim of assisting them in making the tank compliant and safe to fill.

If the deficiency is corrected to the satisfaction of a Gas Supplier, deliveries may recommence. The Gas Suppliers' technical person shall inform the BCGA accordingly.

The BCGA will maintain a list of member companies (who are Gas Suppliers) to be informed in the event of this situation arising (including when a tank is deemed unsafe and if a tank is returned back into service).

5. SECURITY

Storage tanks contain hazardous products. The storage tank installation shall be within a secure area. Deficiencies in security provisions may be sufficient in themselves for Gas Suppliers to decline to supply product and to decline to fill tanks, on the basis of Product Stewardship responsibilities.

Access to the installation shall be limited to authorised persons only. The User may need to authorise access for the Gas Supplier's personnel.

Advice on security can be obtained from the Gas Supplier and from BCGA.

6. REFERENCES

Document Number	Title
1.	The Health and Safety at Work etc. Act, 1974.
2. SI 1999 No. 3242	Management of Health and Safety at Work Regulations, 1999.
3. SI 2000 No. 128	Pressure Systems Safety Regulations 2000 (PSSR).
4. BCGA Code of Practice 4	Gas supply and distribution systems (excluding acetylene).
5. BCGA Code of Practice 26	Bulk liquid carbon dioxide storage at Users' premises.
6. BCGA Code of Practice 36	Cryogenic liquid storage at Users' premises.
7. BCGA Code of Practice 39	In-service requirements of pressure equipment (gas storage and distribution systems).
8. BCGA Code of Practice 42	Implementation of EIGA carbon dioxide standards
9. BCGA Code of Practice 46	The storage of cryogenic flammable liquids.
10. BCGA Leaflet 11	Safety checks for cryogenic tanks.
11. BCGA Leaflet 12	Liquid gas storage tanks – Your responsibilities.

Further information can be obtained from:

UK Legislation

www.legislation.gov.uk

European Industrial Gases Association (EIGA)

www.eiga.eu

British Compressed Gases Association (BCGA)

www.bcgaco.uk

First fill assessment form

An example of a first fill assessment form for a third party owned and maintained tank.

Manufacturer:	<input type="text"/>	Serial Number:	<input type="text"/>
Manufacturer's Type Number:	<input type="text"/>	Date of Manufacture:	<input type="text"/>
Tank Capacity:	<input type="text"/>	Design Code:	<input type="text"/>
Test Pressure:	<input type="text"/>	Design Pressure:	<input type="text"/>
Maximum and Minimum Design Temperature:		Maximum	<input type="text"/> Minimum <input type="text"/>
Inspection Authority:	<input type="text"/>		
Pressure Vessel Construction Material:	<input type="text"/>		
Tank Pressure Relief Valve - Model, Size and Set Point:			
Model	<input type="text"/>	Size	<input type="text"/> Set Point <input type="text"/>
Model	<input type="text"/>	Size	<input type="text"/> Set Point <input type="text"/>
Model	<input type="text"/>	Size	<input type="text"/> Set Point <input type="text"/>
Model	<input type="text"/>	Size	<input type="text"/> Set Point <input type="text"/>
Tank Bursting Disc Size and Set Point:		Size	<input type="text"/> Set Point <input type="text"/>
		Size	<input type="text"/> Set Point <input type="text"/>
State date pressure relief devices last serviced or changed:	<input type="text"/>		
Is a Pressure Relief Changeover Valve fitted?			Yes <input type="checkbox"/> No <input type="checkbox"/>
Can the operation of the above valve isolate all the pressure relief devices?			Yes <input type="checkbox"/> No <input type="checkbox"/>
If 'YES' state method to ensure tank is always protected from over pressure.			
<input type="text"/>			
During normal operation are there at least two independent pressure relief devices always 'on line' to the tank?			Yes <input type="checkbox"/> No <input type="checkbox"/>
If 'NO' state how the tank can be operated safely			
<input type="text"/>			
Is a trycock fitted?			Yes <input type="checkbox"/> No <input type="checkbox"/>
If 'NO' state method of ensuring tank cannot be over filled.			
<input type="text"/>			
Is a tank pressure gauge fitted?			Yes <input type="checkbox"/> No <input type="checkbox"/>
Is a level/contents gauge fitted?			Yes <input type="checkbox"/> No <input type="checkbox"/>
Do all vents discharge to a safe location away from the operator?			Yes <input type="checkbox"/> No <input type="checkbox"/>
Do all vents terminate to prevent the possibility of blockage?			Yes <input type="checkbox"/> No <input type="checkbox"/>
Are thermal relief valves fitted where liquid could be trapped?			Yes <input type="checkbox"/> No <input type="checkbox"/>
Are all piping and fitting materials compatible with the product?			Yes <input type="checkbox"/> No <input type="checkbox"/>
Are fill couplings secure, undamaged and suitable for intended product?			Yes <input type="checkbox"/> No <input type="checkbox"/>
Are all valves used for filling and venting operations operable?			Yes <input type="checkbox"/> No <input type="checkbox"/>
Is the tank protected from overpressure during filling?			Yes <input type="checkbox"/> No <input type="checkbox"/>
If 'NO' give details of how protection is achieved.			
<input type="text"/>			

APPENDIX 1

Sheet 2 of 2

BCGA requires that in accordance with BCGA CP 39 ^[7] a full revalidation shall be carried out on vacuum insulated tanks at a frequency not exceeding 20 years.

Has a revalidation certificate been issued and evidence provided? Yes No

Next revalidation due at:

Has a PSSR ^[3] examination been carried out in accordance with a Written Scheme of Examination and evidence provided? Yes No

Date of next examination

Are the tank supports (wheels, foundations, tank legs) in good condition? Yes No

Is the tank clearly labelled with the product contents? Yes No

State product:

Has evidence been provided that the system is of a suitable design and safe to allow filling? Yes No

If 'NO' detail action to be taken.

During filling, is the User's downstream application protected? Yes No

If 'NO' detail action to be taken.

Is the dedicated fill location suitable, sufficient and in accordance with BCGA CP 26 ^[5], CP 36 ^[6] & CP 46 ^[9]? Yes No

Are the minimum recommended separation distances enforced? Yes No

BCGA Report Form A

This form is to be used to inform the BCGA of a tank that is unsafe to fill and that the User is unwilling to rectify.

<p>The following details a tank that has been identified as unsafe to fill and that the User is unwilling to rectify.</p> <p>PLEASE NOTE: This form will be sent to the BCGA who, after due investigation, will advise their member companies of the safety issue or compliance shortfall.</p> <p>Contact details for BCGA: 4a Mallard Way, Pride Park, Derby DE24 8GX. admin@bcga.co.uk</p>	
<p>Site details. Enter details of the site on which the tank is located.</p>	
User name:	
Site address: (including Post Code)	
Contact Name:	
Contact Tel:	
Contact E-mail:	
<p>Tank details. Enter details of the defective tank.</p>	
Serial number:	
Product:	
Volume:	
Date of report:	
Location:	
<p>Details of defect. Enter details of the defect.</p>	
<p>Reporting BCGA Member details. Please complete the required details below.</p>	
Company Name:	
Address: (including Post Code)	
Contact Name:	
Contact Tel:	
Contact E-mail:	



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www.bcgga.co.uk