BUSINESS IN EUROPE

Product standards

Simple Pressure Vessels

Guidance notes on UK Regulations

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Contents

This guide is intended to assist suppliers of simple pressure vessels to understand the effect of the Regulations. It is not an authoritive interpretation of the Regulations, which is a matter for the Courts.

The guide seeks to explain the requirements of the Regulations in general terms and does not attempt to address detailed issues. You should refer to the Regulations themselves for a full statement of the requirements.

Simple Pressure Vessels - the new law in brief

The Simple Pressure Vessels (Safety) Regulations 1991 entered into force on 31 December 1991 although there was a transitional period to 30 June 1992 during which the Regulations did not apply to the supply and taking into service in the United Kingdom of vessels that complied with pre-existing United Kingdom safety legislation.

The Simple Pressure Vessels (Safety) (Amendment) Regulations 1994 made a number of changes to the 1991 Regulations, in particular, to bring the conformity procedures and marking arrangements into line with those for a number of other products. The amending Regulations entered into force on 1 January 1995.

Therefore from **1 January 1995:**

- most simple pressure vessels with a stored energy of over 50 bar.litres, including imports, when supplied in the United Kingdom must:
  - meet the essential safety requirements;
  - have safety clearance (which involves checking by an approved body);
  - bear CE marking and other specified inscriptions;
  - be accompanied by manufacturer's instructions;
  - be safe.
- most simple pressure vessels with a stored energy of up to 50 bar. litres, including imports, when supplied in the United Kingdom must:
  - be manufactured in accordance with engineering practice recognised as sound in a country within the European Economic Area (EEA);
  - bear specified inscriptions (but not CE marking);
  - be safe.
- similar requirements apply to such vessels when taken into service in the United Kingdom by the manufacturer or importer.

There are other provisions affecting manufacturers, importers, suppliers and users.

The Regulations do not apply to exports to countries outside the EEA.

Failure to comply with these requirements:

- **means that those vessels cannot legally be supplied in the United Kingdom;**

- **could result in prosecution and penalties on conviction of a fine of up to £5,000 or, in some cases, of imprisonment for up to three months, or of both.**

The same rules apply everywhere in the EEA, so complying vessels may be supplied anywhere in the EEA.

Free movement of goods

Achieving the free movement of goods lies at the heart of achieving an open market for business in Europe.

In May 1985, European Community Ministers agreed on a 'New Approach To Technical Harmonisation and Standards' in order to fulfil this objective.

'New Approach' Directives (that is Community laws) set out 'essential requirements' (for safety, for example), written in general terms, which must be met before products may be placed on the market in the United Kingdom or anywhere else in the Community. European standards fill in the detail and are the main way for businesses to meet the 'essential requirements'. The Directives also say how manufacturers are to show that products meet the 'essential requirements'. Products meeting the requirements are to carry CE marking, which should mean that they can be supplied anywhere in the Community, provided they are safe.

The Simple Pressure Vessels Directive 87/404/EEC, as amended by Directives 90/488/EEC and 93/68/EEC, is one such Directive. It has been implemented in United Kingdom law by the Simple Pressure Vessels (Safety) Regulations 1991 and the Simple Pressure Vessels (Safety) (Amendment) Regulations 1994. This booklet describes those Regulations.

The Simple Pressure Vessels Directive has also been extended by the European Economic Area Agreement which came into force on 1 January 1994. Under the Agreement the provisions of the Directive now apply across the fifteen Member States of the European Community and three states of the European Free Trade Association: Norway, Iceland and, from 1 May 1995, Liechtenstein.

The Simple Pressure Vessels (Safety) Regulations 1991 (SI 1991/2749) as amended (SI 1994/3098)

APPLICATION

Entry into force: 31 December 1991.

Primary legislation: the European Communities Act 1972.

Coverage: the Regulations apply to:

- simple pressure vessels ('vessels'), are vessels which are intended to contain air or nitrogen at a gauge pressure greater than 0.5 bar but less than or equal to 30 bar and not intended to be exposed to flame. They are manufactured in series and are of welded steel or aluminium construction;

- relevant assemblies, that is any assembly incorporating a vessel.

The full definition of a 'simple pressure vessel' is reproduced at Annex A.

Prohibition on supply and taking into service: the Regulations make it an offence:

- for any person being:

  - the manufacturer of a vessel;

  - the manufacturer of a relevant assembly who imported the vessel incorporated therein from a country or territory outside the EEA; or

  - the person who imported a vessel or relevant assembly from such a country or territory.

  to supply in the United Kingdom:

  - a vessel, unless it complies with the safety requirements (see below); or

  - a relevant assembly, unless the vessel incorporated in that assembly complies with the safety requirements.

- for the manufacturer of a vessel himself to take into service in the United Kingdom:

  - that vessel, unless it complies with the safety requirements; or

- a relevant assembly incorporating that vessel, unless the vessel complies with the safety requirements.

- for the importer into the United Kingdom of a vessel or a relevant assembly to take into service in the United Kingdom:

  - that vessel, unless it complies with the safety requirements;

  - a relevant assembly incorporating that vessel, unless the vessel complies with the safety requirements; or

  - the imported relevant assembly, unless the vessel incorporated in that assembly complies with the safety requirements.

The Regulations also make it an offence for any supplier to supply a vessel or relevant assembly **unless it is safe.**

The Regulations prohibit the supply or taking into service of vessels and relevant assemblies in the circumstances described above; but it is always the vessel that must comply with the safety requirements.

- The Regulations adopt the definition of 'supply' in section 46 of the Consumer Protection Act 1987 which is reproduced, less certain words not relevant for present purposes, at Annex B, but extend its meaning to include offering or agreeing to supply, and exposing or possessing for supply.

- The Regulations do not define 'take into service'.

EXCEPTIONS

The Regulations, and hence the prohibitions on supply and taking into service, do not apply to:

- a vessel first supplied or taken into service within the European Community before 1 July 1992 which conforms with the safety provisions, other than the Regulations, having effect in the United Kingdom.

- a relevant assembly first supplied or taken into service within the European Community before 1 July 1992 (or a relevant assembly first supplied or taken into service within the European Community(*) on or after 1 July 1992 where the vessel incorporated in that assembly was first supplied or taken into service within the European Community before 1 July 1992) where the vessel incorporated in that assembly conforms with the safety provisions, other than the Regulations, having effect in the United Kingdom.

(*) The EEA on or after 1 January 1994.

These exceptions applied for a transitional period. They allow vessels and relevant assemblies to continue to be supplied or taken into service in the United Kingdom if the vessels (or the vessels incorporated in the assembly) conform with all the relevant United Kingdom safety legislation other than the Regulations, such as the Health and Safety at Work etc. Act 1974 and the Pressure Systems and Transportable Gas Containers Regulations 1989 and in Northern Ireland, the Health and Safety at Work (Northern Ireland) Order 1978 and the Pressure Systems and Transportable Gas Containers Regulations (Northern Ireland (1991)).

- ❑ a vessel or a relevant assembly supplied in the United Kingdom if the supplier believes (with reasonable cause) that it will not be taken into service either in the United Kingdom or elsewhere in the EEA.

- ❑ a vessel or relevant assembly which has previously been taken into service in the European Community or, since 1 January 1994, in the EEA.

These are permanent exceptions. They allow non-complying vessels, and relevant assemblies incorporating non-complying vessels, to be supplied in the United Kingdom if the supplier believes (with reasonable cause) that they will be exported outside the EEA or, for example, they are second-hand vessels.

- ❑ a vessel first supplied or taken into service within the European Community before 1 July 1992 where:

  - ■ the supplier believes (with reasonable cause) that the vessel will not be taken into service in the United Kingdom; and

  - ■ the vessel conforms with the safety provisions having effect in a Member State of the EEA other than the United Kingdom in which the supplier believes (with reasonable cause) it will be taken into service.

- ❑ a relevant assembly first supplied or taken into service within the European Community before 1 July 1992 (or a relevant assembly first supplied or taken into service within the European Community(*) on or after 1 July 1992 where the vessel incorporated in that assembly was first supplied or taken into service within the European Community before 1 July 1992) where:

  - ■ the supplier believes (with reasonable cause) that the relevant assembly will not be taken into service in the United Kingdom, and

(*) The EEA on or after 1 January 1994.

- the vessel incorporated in that assembly conforms with safety provisions having effect in a Member State other than the United Kingdom in which the supplier believes (with reasonable cause) the relevant assembly will be taken into service.

These exceptions also applied for a transitional period. They allow non-complying vessels, and relevant assemblies incorporating non-complying vessels, to continue to be supplied in the United Kingdom if the supplier believes (with reasonable cause) that they will be exported to a Member State other than the United Kingdom and that the vessels conform with the national safety provisions in force in that Member State.

- None of these exceptions apply where the vessel (whether or not incorporated in a relevant assembly) bears the CE marking or any other inscription which is likely to be confused with the CE marking

CATEGORIES OF VESSELS

The Regulations make different provisions for different categories of vessels, depending on their stored energy, expressed in terms of the product of maximum working pressure in bar and its capacity in litres (PS.V).

- **Category A** consists of vessels whose PS.V is more than 50 bar.litres, and is divided into:
  - **Category A.1**, consisting of vessels whose PS.V is more than 3,000 but not more than 10,000 bar.litres;
  - **Category A.2**, consisting of vessels whose PS.V is more than 200 but not more than 3,000 bar.litres; and
  - **Category A.3**, consisting of vessels whose PS.V is more than 50 but not more than 200 bar.litres.
- **Category B** consists of vessels whose PS.V is 50 bar.litres or less.

SAFETY REQUIREMENTS

The safety requirements for a vessel in **Category A** are that:

1. It meets the essential safety requirements;
2. It has safety clearance;
3. The CE marking and the other specified inscriptions have been affixed;
4. In the case of the supply of a vessel or a relevant assembly, it must be accompanied by the manufacturer's instructions;

In the case of the taking into service of a vessel or a relevant assembly, the manufacturer or importer must ensure that, at the time of the taking into service, the manufacturer's instructions are made available to all those concerned with the vessel's installation and operation.

5. It is in fact safe.

The safety requirements for a vessel in **Category B** are that:

- ❑ it is manufactured in accordance with engineering practice recognised as sound in an EEA State;
- ❑ it bears the specified inscriptions (but not the CE marking);
- ❑ it is in fact safe.

HOW TO COMPLY WITH THE SAFETY REQUIREMENTS FOR CATEGORY 'A' VESSELS

1. The essential safety requirements

The essential safety requirements are reproduced in Annex C. The provisions cover the design, manufacturing processes and material requirements. However, if the vessels are made in conformity with a specified published European standard, which has also been published as an identically worded national standard ('relevant national standard'), they will be presumed to comply with the essential requirements.

The relevant national standard.

The European Committee for Standardisation (CEN) has developed a European standard which has been published in four parts as:

BS EN 286 - 1 Simple unfired pressure vessels designed to contain air or nitrogen - Part 1: Design, manufacture and testing.

BS EN 286 - 2 Simple unfired pressure vessels designed to contain air or nitrogen - Part 2: Pressure vessels designed to contain compressed air for air braking and auxiliary systems for motor vehicles and their trailers.

BS EN 286 - 3 Simple unfired pressure vessels designed to contain air or nitrogen - Part 3: Steel pressure vessels designed for air-braking equipment and auxiliary pneumatic equipment for railway rolling stock.

BS EN 286 - 4 Simple unfired pressure vessels designed to contain air or nitrogen - Part 4: Aluminium alloy pressure vessels designed for air-braking equipment and auxiliary pneumatic equipment for railway rolling.

British standards are available from BSI Standards sales and enquiries should be addressed to BSI Information Centre (see page 18).

2. Safety clearance

A vessel in category A has safety clearance once the approved body has issued a certificate of conformity under the EC verification procedure, or an EC certificate of conformity as part of the EC certificate of conformity procedure. The steps necessary to obtain safety clearance are shown in diagrammatic form in Annex G.

The **first step** is for the manufacturer, or his authorised representative established in the EEA, to apply for and obtain from an approved body, before series manufacture commences, an EC certificate of adequacy or an EC type examination certificate (see Annex D for details). Where the vessels are to be manufactured so as to conform with a 'relevant national standard', the applicant may choose for which certificate to apply; where that is not the case, the application must be for a type examination certificate.

The **second step** depends on the category of vessel.

In the case of vessels in **Category A.1**, after commencing series manufacture, the rnanufacturer, or his authorised representative established in the EEA, must have the vessels checked by an approved body and obtain a certificate of conformity as part of the EC verification procedure (see Annex E for details).

However, in the case of vessels in **Category A.2 and A.3** there is a choice:

- ❑ either the manufacturer, or his authorised representative established in the EEA must comply with the EC verification procedure; or

- ❑ with the EC certificate of conformity procedure (see Annex F for details). In this case the manufacturer (not an authorised representative) must, before series manufacture commences, have the design and manufacturing schedule checked by the approved body which issued the certificate of adequacy, or the type-examination certificate. The approved body will issue an EC certificate of conformity as part of the procedure.

Approved bodies are designated by the Member States, in the case of the United Kingdom by the Secretary of State for Trade and Industry. A list of UK approved bodies is available from the DTI, Standards Policy Unit at the address on page 18. Applications for certificates of adequacy and type examination certificates may however be made to any approved body, not only to a body designated by the Secretary of State.

The European Commission publishes EEA-wide lists of approved bodies (*Official Journal of the European Communities* No C203 of 23.7.94 - available from HMSO - see page 18.)

3. The CE marking and other specified inscriptions

The steps necessary before the CE marking may be applied to vessels in Category A are also shown in diagrammatic form in Annex G.

- ❑ When a certificate of conformity has been issued by the approved body as part of the EC verification procedure the manufacturer (or his authorised representative) may apply the CE marking to the vessels which he declares to be in conformity with the type described in the EC type-examination certificate or with the design and manufacturing schedule. If the manufacturer has made a declaration as part of the EC certificate of conformity procedure however then only the manufacturer can apply CE marking.

- ❑ The CE marking consists of the symbol illustrated below and (where applicable) the distinguishing number assigned by the European Commission to the approved body responsible for checking that the vessels conform or for EC surveillance (see below).

The CE marking is as illustrated in diagram 1, below. It may not be smaller than 5mm in its vertical height, and the proportions in diagram 2, below must be maintained whatever its size. **The grid does not form part of the marking and is for information only.**

Diagram 1

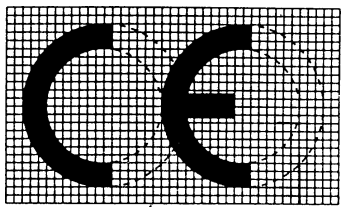

Diagram 2

The other specified inscriptions to be applied to vessels in Category A and B are:

- ■ maximum working pressure in bar;

- maximum working temperature in °C;
- minimum working temperature in °C;
- capacity of the vessel in litres;
- name or mark of the manufacturer;
- type and serial or batch identification of the vessel;
- the last two digits of the year in which the CE marking was affixed.

The CE marking and the other specified inscriptions must be affixed in a visible, easily legible and indelible form either to the vessel itself or to a data plate attached to the vessel in such a way that it cannot be removed.

If a data plate is used, it must be so designed that it cannot be re-used, and must include a vacant space to enable other information to be provided.

Vessels complying with the Regulations may be subject to other Community Directives. In this case, the CE marking indicates that the vessel complies with all relevant Directives. Where one or more of the relevant Directives are subject to transitional arrangements, it should be specified, in the accompanying documentation, with which Directives the vessel complies.

Vessels bearing CE marking can be presumed to comply with the Simple Pressure Vessels Directive unless there are reasonable grounds for suspecting otherwise.

Other markings may be affixed to the vessels provided that the visibility and legibility of the CE marking is not thereby reduced.

At the option of the manufacturer or his authorised representative established in the EEA, vessels first supplied before 1 January 1997 may carry the CE marking as set out in the Simple Pressure Vessels (Safety) Regulations 1991 (i.e. including the last two digits of the year of affixation).

The Regulations make it an offence to affix to a vessel any markings which are likely to deceive any person as regards the meaning and form of CE marking.

Anyone supplying or taking into service a vessel that does not bear CE marking must, on request, give an enforcement authority any information he has, or which is available to him, about when the vessel was first supplied or taken into service in the EEA and why the vessel does not bear that marking.

4. The manufacturer's instructions

They are defined in the Regulations as instructions:

- ❑ issued by or on behalf of the manufacturer;
- ❑ providing the following information:
  - ■ the manufacturer's name or mark;
  - ■ vessel type, batch identification or other particulars identifying the vessel to which the instructions relate;
  - ■ particulars of maximum working pressure in bar, maximum and minimum working temperatures in °C and capacity in litres;
  - ■ the intended use of the vessel;
  - ■ maintenance and installation requirements for vessel safety.
- ❑ in the official language of the EEA State where the manufacturer believes the vessel is to be taken into service. If the destination, or the EEA State in which the vessel is to be taken into service is not known, the instructions shall be in any official language of the EEA.

5. It is in fact safe

The Regulations define **'safe'** as meaning that, when a vessel is properly installed and maintained and used for the purposes for which it is intended, there is no risk (apart from one reduced to a minimum) of its being the cause or occasion of death or injury to persons or domestic animals, or damage to property.

EC surveillance: a manufacturer of vessels in category A.2 who has elected to comply with the EC certificate of conformity procedure, becomes subject to EC surveillance by the approved body which issued the EC certificate of adequacy or the EC design and examination certificate for the vessels.

A United Kingdom manufacturer subject to EC surveillance must:

- ❑ authorise access at any reasonable time by or on behalf of the approved body to any place where vessels covered by the EC certificate of conformity (or relevant assemblies incorporating such vessels) are manufactured or are stored by him or on his behalf for the purpose of inspecting the manufacturing processes and the vessels so covered;
- ❑ allow inspectors acting on the approved body's behalf to select random samples of vessels covered by the certificate (or relevant assemblies incorporating such vessels) for inspection;

- ❑ if requested by the inspectors, provide:
  - ■ copies of the reports regarding tests that the manufacturer undertook would be made when he applied for the EC certificate of conformity;
  - ■ any information forming part of the design and manufacturing schedule that has become available only subsequent to that application.
- ❑ comply with any reasonable request made by or on behalf of the approved body for additional information about manufacture or the safety of vessels covered by the certificate.

The approved body:

- ❑ ascertains whether tests have actually been carried out in course of manufacture in accordance with the undertakings given by the manufacturer when applying for the EC certificate of conformity;
- ❑ takes random samples of vessels for the purposes of inspection.

A United Kingdom approved body must from time to time compile written reports on its EC surveillance of each manufacturer, and, if requested, supply a copy to the Secretary of State, the European Commission, any other Member State and any other approved body.

Retention of documentation: a United Kingdom manufacturer of vessels must retain for at least 10 years from the date on which the last vessel in the series is manufactured:

- ❑ copies of all documents submitted by him, or his authorised representative established in the EEA, to an approved body for the purpose of obtaining any EC certificate;
- ❑ any certificate issued by an approved body to him, or his authorised representative, and any documents accompanying such a certificate;
- ❑ any EC declaration of conformity he executes;
- ❑ any information forming part of the design and manufacturing schedule that becomes available only subsequent to the application for an EC certificate of conformity.
- ❑ any reports made by qualified personnel as part of the EC certificate of conformity procedure requirements for hydraulic or pneumatic pressure testing.

An enforcement authority may require the production of this documentation.

Enforcement: in Great Britain the Health and Safety Executive, and in Northern Ireland the Department of Economic Development, are responsible for enforcing the Regulations in relation to vessels and relevant assemblies for use at work.

In Great Britain trading standards authorities, and in Northern Ireland district councils, are responsible for enforcing the Regulations in relation to consumer goods. The Secretary of State for Trade and Industry also has a role in relation to consumer goods.

For this purpose those enforcement authorities have available to them various powers available under the Health and Safety at Work etc. Act 1974, the Health and Safety at Work (Northern Ireland) Order 1978, and the Consumer Protection Act 1987.

Where a vessel bearing the CE marking is safe but there are breaches of other obligations, the manufacturer or his authorised representative established in the EEA will be given the opportunity to correct the breach before further enforcement action is taken.

Penalties: the maximum penalty for contravening the prohibition on supply and taking into service is imprisonment for up to three months, or a fine of up to £5,000, or both. The penalty for other contraventions of the Regulations is a fine of up to £5,000.

It is for the Courts to decide the penalty in any case taking into account the severity of the offence.

Where anyone is convicted of an offence and it appears to the court that it is in his power to take remedial action, the Regulations empower the court to order him to take specified remedial action.

The Regulations provide a defence of due diligence, and for proceedings to be taken against a person other than the principal offender or, broadly, officers of a company or other body corporate.

Free circulation: under European Community rules and the Simple Pressure Vessels Directive (as amended), which has been adopted by all the EEA States, those states are required not to impede the supply or taking into service of vessels that satisfy the requirements of that Directive, and are required to presume that vessels bearing CE marking meet all the provisions of the Directive.

Safeguard procedure: EEA States are required to take all appropriate measures to withdraw from the market any vessels with CE marking which are considered to be unsafe or to prohibit and restrict their supply. They must then immediately inform the European Commission what they have done and why. The Commission will consult the parties concerned as soon as possible, and, if it finds the action justified, immediately so inform all EEA States.

Other legislation: the Health and Safety at Work etc. Act 1974 and the Pressure Systems and Transportable Gas Containers Regulations 1989 in Northern Ireland, the Health and Safety at work (Northern Ireland) Order 1978 and the Pressure Systems and Transportable Gas Containers Regulations (Northern Ireland) 1991, continue to apply to users and owners of vessels for use at work.

Provision and Use of Work Equipment Regulations 1992[1]: these Regulations, implementing a complementary Directive on the use of work equipment entered into force on 1 January 1993. They place general duties on employers and list minimum requirements for work equipment to deal with selected hazards. Corresponding legislation in Northern Ireland (the Provision and Use of Work Equipment Regulations (Northern Ireland) 1993[2]) entered into force on 22 February 1993. Copies of the Regulations are available from HMSO. Enquiries should be addressed to the HSE Public Enquiry Point on 01742 892345 or, in Northern Ireland, the Department of Economic Development on 01232 251333.

Pressure Equipment Directive (PED): this proposed directive will cover pressure vessels, piping, boilers and safety accessories for all fluids under a pressure greater than 0.5 bar. Simple Pressure Vessels, as covered by 87/404/EEC will however be specifically excluded from the PED so the two directives will run in parallel. The PED is expected to be adopted in 1996 and to come into force in 1999. Further information on the PED can be obtained from the Department of Trade and Industry, Standards and Technical Regulations Directorate* 5, Third Floor, 151 Buckingham Palace Road, London SW1W 9SS.

(1) SI 1992/2932.
(2) SR 1993/19.
* formerly Standards Policy Unit

Further information

Availability of relevant national standards: the British Standards, and other standards that are relevant national standards, can be obtained from BSI Standards Sales at 389 Chiswick High Road, Chiswick, London W4 4AT. Tel: 0181 996 7000. Fax: 0181 996 7001.

Availability of text of the Regulations: the Simple Pressure Vessels (Safety) Regulations 1991 (SI 1991/2749) and the Simple Pressure Vessels (Safety) (Amendment) Regulations 1994 (SI 1994/3098) are available from HMSO and its agents (see below).

Availability of text of Directives: the complete texts of the Simple Pressure Vessels Directive (Directive 87/404/EEC), the amending Directive (Directive 90/488/EEC) and the CE Marking Directive (93/68/EEC) have been published in the *Official Journal of The European Communities* (No L220 of 8.8.1987, No L270 of 2.10.1990 and No L220 of 30.8.93 respectively). Copies of these texts are available from HMSO and its agents (see below), European Information Centres and European Documentation Centres located throughout the United Kingdom. To locate your nearest Centre, consult the DTI's single market booklet *Contacts*, available through the DTI's Business in Europe Hotline on 0117 944 4888.

Copies of the Directives or the Regulations are available from HMSO Publications Centre, PO Box 276, London SW8 5DT. Tel: 0171 873 9090. Fax: 0171 873 8200.

BSI's Information Centre can provide information about the standards which may be used to demonstrate conformity with the essential safety requirements. Enquiries should be addressed to: BSI Information Centre, Mechanical Group, 389 Chiswick High Road, Chiswick, London W4 4AL. (Tel: 0181 996 7024. Fax: 0181 996 7048).

Where compliant vessels are denied proper access to the market in other EEA countries, contact: The Single Market Compliance Unit, Department of Trade and Industry, Bay 210, Kingsgate House, 66-74 Victoria Street, London SW1E 6SW. (Fax: 0171 215 4489).

Enquiries relating to policy issues, particularly those which need to be taken up at the European level should be addressed to: Department of Trade and Industry, Standards and Technical Regulations Directorate*, Third Floor Red Zone, 151 Buckingham Palace Road, London SW1W 9SS.

Further copies of this booklet are available from the DTI's Business in Europe Hotline on 0117 944 4888.

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* formerly Standards Policy Unit

Definition of 'simple pressure vessel'. Exclusions from the application of the Regulations

SIMPLE PRESSURE VESSELS

"2 (1) In these Regulations, 'vessel' means a simple pressure vessel being a welded vessel intended to contain air or nitrogen at a gauge pressure greater than 0.5 bar, not intended for exposure to flame, and having the following characteristics:

(a) the components and assemblies contributing to the strength of the vessel under pressure are made either of non-alloy quality steel, or of non-alloy aluminium, or of non-age hardening aluminium alloy;

(b) the vessel consists either:

(i) of a cylindrical component with circular cross-section, closed at each end, each end being either outwardly dished or flat and being also co-axial with the cylindrical component; or

(ii) of two co-axial outwardly dished ends;

(c) the maximum working pressure (PS) is not more than 30 bar, and PS.V (being the product of PS and the vessel's capacity expressed in litres) is not more than 10,000 bar.litres;

(d) the minimum working temperature is not lower than minus 50° C, and the maximum working temperature is not higher than:

300° C in the case of steel vessels; and

100° C in the case of aluminium or aluminium alloy vessels,

and in this paragraph:

(i) 'maximum working pressure' means the maximum gauge pressure which may be exerted under normal conditions of use;

(ii) 'minimum working temperature' means the lowest stabilised temperature in the wall of the vessel under normal conditions of use; and

(iii) 'maximum working temperature' means the highest stabilised temperature in the wall of the vessel under normal conditions of use."

EXCLUSIONS FROM THE APPLICATION OF THE REGULATIONS

"3 (1) .....these Regulations apply, and shall apply only, to vessels manufactured in series.

(2) These Regulations do not apply to:

(a) vessels designed specifically for nuclear use, where vessel failure might or would result in an emission of radioactivity;

(b) vessels intended specifically for installation in, or for use as part of the propulsive system of, a ship or aircraft; or

(c) fire-extinguishers;

and in this paragraph, 'ship' has the meaning given by section 742 of the Merchant Shipping Act 1894."

Series Manufacture

"2 (1) .....

(4) There is series manufacture within the meaning of these Regulations if more than one vessel of the same type is manufactured during a given period by the same continuous manufacturing processes, in accordance with a common design.

(5) ....."

Definition of 'supply'

"46 (1) Subject to the following provisions of this section, references in this Act to supplying goods shall be construed as references to doing any of the following, whether as principal or agent, that is to say:

(a) selling, hiring out or lending the goods;

(b) entering into a hire-purchase agreement to furnish the goods;

(c) the performance of any contract for work and materials to furnish the goods;

(d) providing the goods in exchange for any consideration (including trading stamps) other than money;

(e) providing the goods in or in connection with the performance of any statutory function; or

(f) giving the goods as a prize or otherwise making a gift of the goods;

.....

(2) For the purposes of any reference in this Act to supplying goods, where a person ('the ostensible supplier') supplies goods to another person ('the customer') under a hire-purchase agreement, conditional sale agreement or credit-sale agreement or under an agreement for the hiring of goods (other than a hire-purchase agreement) and the ostensible supplier:

(a) carries on the business of financing the provision of goods for others by means of such agreements; and

(b) in the course of that business acquired his interest in the goods supplied to the customer as a means of financing the provision of them for the customer by a further person ('the effective supplier'),

the effective supplier and not the ostensible supplier shall be treated as supplying the goods to the customer.

(3) .....the performance of any contract by the erection of any building or structure on any land or by the carrying out of any other building works shall be treated for the purposes of this Act as a supply of goods in so far as, but only in so far as, it involves the provision of any goods to any person by means of their incorporation into the building, structure or works.

(4) .....references in this Act to supplying goods shall not include references to supplying goods comprised in land where the supply is effected by the creation or disposal of an interest in land.

(5) .....references in this Act to a person's supplying goods shall be confined to references to that person's supplying goods in the course of a business of his, but for the purposes of this subsection it shall be immaterial whether the business is a business of dealing in the goods.

(6) For the purposes of subsection (5) above goods shall not be treated as supplied in the course of a business if they are supplied, in pursuance of an obligation arising under or in connection with the insurance of the goods, to the person with whom they were insured .

(7) Except for the purposes of, and in relation to, ..suspension notices, references ..to supplying goods shall not include:

(a) references to supplying goods where the person supplied carries on a business of buying goods of the same description as those goods and repairing or reconditioning them:

(b) references to supplying goods by a sale of articles as scrap (that is to say, for the value of materials included in the articles rather than for the value of the articles themselves).

(8) Where any goods have at any time been supplied by being hired out or lent to any person, neither a continuation or renewal of the hire or loan (whether on the same or different terms) nor any transaction for the transfer after that time of any interest in the goods to the person to whom they were hired or lent shall be treated for the purposes of this Act as a further supply of the goods to that person.

(9) A ship, aircraft or motor vehicle shall not be treated for the purposes of this Act as supplied to any person by reason only that services consisting in the carriage of goods or passengers in that ship, aircraft or vehicle, or in its use for any other purpose, are provided to that person in pursuance of an agreement relating to the use of the ship, aircraft or vehicle for a particular period or for particular voyages, flights or journeys."

Essential safety requirements

PART 1 - MATERIALS

1. Materials must be selected according to the intended use of the vessels and in accordance with the following provisions of this Part.

Pressurised components

2. The non-alloy quality steel, non-alloy aluminium or non-age hardening aluminium alloy used to manufacture the pressurised components must:

- be capable of being welded;
- be ductile and tough, so that a rupture at the minimum working temperature does not give rise to either fragmentation or brittle-type fracture; and
- not be adversely affected by ageing.

For steel vessels, the materials must in addition meet the requirements set out in paragraph 3 below and, for aluminium or aluminium alloy vessels, those set out in paragraph 4 below. They must be accompanied by an inspection slip.

Steel vessels

3. Non-alloy quality steels must meet the following requirements:

(a) they must be non-effervescent and be supplied after normalisation treatment, or in an equivalent state;

(b) the content per product of carbon must be less than 0.25% and that of sulphur and phosphorus must each be less than 0.05%; and

(c) they must have the following mechanical properties per product:

- the maximum tensile strength must be less than 580 Newtons per square millimetre (N/mm^2);
- the elongation after rupture must be:
  - if the test piece is taken parallel to the direction of rolling:

    thickness $\geq$ 3mm: A $\geq$ 22%
    thickness < 3mm: $A_{80mm} \geq 17\%$

- if the test piece is taken perpendicular to the direction of rolling:

  thickness ≥ 3mm: A ≥ 20%
  thickness < 3mm: A_{80mm} ≥ 15%; and

- the average rupture energy for three longitudinal test pieces at the minimum working temperature must not be less than 35 Joules per square centimetre (J/cm^2). Not more than one of the three figures may be less than 35 J/cm^2, with a minimum of 25 J/cm^2.

In the case of steels used to manufacture vessels whose minimum working temperature is lower than minus 10°C and whose wall thickness exceeds 5 millimetres, the average rupture energy must be checked.

Aluminium vessels

4. Non-alloy aluminium must have an aluminium content of at least 99.5% and non-age hardening aluminium alloys must display adequate resistance to intercrystalline corrosion at the maximum working temperature. Moreover these materials must meet the following requirements:

   (a) they must be supplied in an annealed state; and

   (b) they must have the following mechanical properties per product:

   - the maximum tensile strength must be no more than 350 N/mm^2 ; and

   - the elongation after rupture must be:

     - A ≥ 16% if the test piece is taken parallel to the direction of rolling;

     - A ≥ 14% if the test piece is taken perpendicular to the direction of rolling.

Welding materials

5. The welding materials used to make the welds on or of the vessel must be appropriate to and compatible with the materials to be welded.

Accessories contributing to the strength of the vessel

6. These accessories (bolts, nuts etc) must be made either of a material specified in paragraphs 2 to 4 above or of another kind of steel, aluminium or aluminium alloy which:

   - is appropriate to and compatible with the materials used to manufacture the pressurised components; and

- at the minimum working temperature has an appropriate elongation after rupture and toughness.

Non-pressurised components

7. All welded non-pressurised components must be of a material which is compatible with that of the parts to which they are welded.

PART 2 - VESSEL DESIGN

8. The manufacturer must, when designing the vessel, define the use to which it will be put, and select:

- the minimum working temperature;
- the maximum working temperature; and
- the maximum working pressure.

However, should a minimum working temperature higher than minus 10°C be selected, the properties required of the materials must be satisfied at minus 10°C.

The manufacturer must also take account of the following requirements:

- it must be possible to inspect the inside of the vessels;
- it must be possible to drain the vessels;
- the mechanical qualities must be maintained throughout the period of use of the vessel for its intended purpose;
- the vessels must, bearing in mind their envisaged use, be adequately protected against corrosion,

and of the fact that under the conditions of use envisaged:

- the vessels will not be subjected to stresses likely to impair their safety in use; and
- the internal pressure will not permanently exceed the maximum working pressure; however, it may momentarily do so by up to 10%.

Circular and longitudinal seams must be made using full penetration welds or welds of equivalent effectiveness. Dished ends other than hemispherical ones must have a cylindrical edge.

Wall thickness

9. In the case of vessels in Category A.2 or A.3 whose maximum working temperature does not exceed 100°C, the manufacturer must select either the calculation method or the experimental method, as defined below, for determining vessel wall thickness.

In the case of vessels in Category A.1 or vessels in Category A.2 or A.3 whose maximum working temperature exceeds 100°C, the calculation method must be used.

However, the actual wall thickness of the cylindrical component and ends must in any case be not less than 2 millimetres in the case of steel vessels, and not less than 3 millimetres in the case of aluminium or aluminium alloy vessels.

Calculation method:

The minimum thickness of the pressurised components must be calculated having regard to the intensity of the stresses and to the following requirements:

- the calculation pressure to be taken into account must not be less than the maximum working pressure; and

- the permissible general membrane stress must not exceed 0.6 times the yield strength at the maximum working temperature (R_{ET}) or 0.3 times the tensile strength (Rm) whichever value is the lower. The manufacturer must use the minimum values of R_{ET} and Rm guaranteed by the producer of the materials in order to determine the permissible stress.

However, where the cylindrical component of the vessel has one or more longitudinal welds made using a non-automatic welding technique, the thickness calculated as above must be multiplied by the coefficient 1.15.

Experimental method:

Wall thickness must be so determined as to enable the vessels to resist at ambient temperature a pressure equal to at least 5 times the maximum working pressure, with a maximum permanent circumferential deformation factor of 1%.

PART 3 MANUFACTURING PROCESSES

10. Vessels must be constructed and checked in accordance with the design and manufacturing schedule referred to in Annex D.

Preparation of the component parts

11. The preparation of the component parts (e.g. forming and chamfering) must not give rise to surface defects, cracks or changes in the mechanical properties of those parts likely to be detrimental to the safety of the vessels.

Welds on pressurised components

12. The characteristics of welds and adjacent zones must be similar to those of the welded materials and must be free of any surface or internal defects detrimental to the safety of the vessels.

Welds must be made by appropriately qualified welders or operators in accordance with approved welding techniques. 'Qualified' means qualified by means of tests carried out by an approved body; and 'approved' means approved by such a body.

The manufacturer must also, during manufacture, ensure consistent weld quality by conducting appropriate tests using adequate procedures. These tests must be the subject of a written report.

PART 4 DEFINITIONS AND SYMBOLS

Definitions

13. In this Annex:

(a) 'minimum working temperature' means the lowest stabilised temperature in the wall of the vessel under normal conditions of use;

(b) 'inspection slip' means the document by which the producer of the materials certifies that the materials delivered to the manufacturer meet the requirements set by the manufacturer, and in which the producer sets out the results of the routine inspection tests carried out during the production of those materials (or of materials produced by the same process but not being the materials delivered to the manufacturer) in particular as to their chemical composition and mechanical properties;

(c) 'maximum working temperature' means the highest stabilised temperature in the wall of the vessel under normal conditions of use:

(d) 'maximum working pressure' means the maximum gauge pressure which may be exerted under normal conditions of use; and

(e) 'yield strength at the maximum working temperature' means:

- the upper yield point for a material with both a lower and an upperyield point; or
- the proof stress at 0.2%; or
- the proof stress at 1.0% in the case of non-alloy aluminium.

Symbols

14. In this Annex:

(a) 'A' means the percentage elongation after rupture ($L_o = 5.65\sqrt{S_o}$) where L_o is the gauge length expressed in millimetres and S_o is the cross-sectional area of the test section expressed in square millimetres: and

(b) 'A_{80mm}' means the percentage elongation after rupture (L_o = 80mm).

EC Certificate of Adequacy, EC Type-examination Certificate, Design and manufacturing schedule

1. All applications must be in writing.

2. All applications, and any accompanying documents, must be in the official language of the EEA State in which that body is established (in the United Kingdom, English) or in another language acceptable to it.

3. Approved bodies designated by the Secretary of State for Trade and Industry (United Kingdom approved bodies) may charge a fee and may require that fee, or a reasonable estimate of it, to be paid with the application.

EC CERTIFICATE OF ADEQUACY

4. The application must be accompanied by the design and manufacturing schedule (see paragraph below).

5. A United Kingdom approved body must, if satisfied that the schedule contains all the required information and that vessels manufactured in accordance with the schedule would conform with a relevant national standard, issue a certificate of adequacy.

EC TYPE-EXAMINATION CERTIFICATE

6. EC type-examination is the procedure by which an approved body ascertains that a prototype representative of the production envisaged satisfies the requirements of the Simple Pressure Vessels Directive as amended.

7. The application must:

- specify the name and address of the applicant;
- specify the proposed place of manufacture of the vessels to which it relates;
- be accompanied by the prototype (which may be representative of a 'family' of vessels).
- be accompanied by the design and manufacturing schedule.

8. A United Kingdom approved body must:

- satisfy itself that the schedule contains all the required information;
- examine, and perform appropriate tests on, the prototype;
- if satisfied that the prototype is manufactured in conformity with the schedule, meets the essential safety requirements and is safe, issue a type-examination certificate recording its conclusions.

9. The type-examination certificate may be issued subject to conditions, and is to be accompanied by the descriptions and drawings necessary to identify the prototype.

10. The United Kingdom approved body is to supply to the Secretary of State, the European Commission, any other EEA State or any other approved body on request a copy of the type-examination certificate and, on reasoned request, a copy of the design and manufacturing schedule and of its reports on examinations and tests carried out.

11. Where a United Kingdom approved body withdraws a type-examination certificate, it shall so inform the Secretary of State, giving its reasons, with a view to this information being passed by him to the Commission and the other Member States.

DESIGN AND MANUFACTURING SCHEDULE

12. The design and manufacturing schedule must contain a description of the techniques and operations employed in order to meet a relevant national standard or the essential safety requirements specified in Annex C.

13. In particular it must comprise:

(a) a detailed manufacturing drawing of the vessel type;

(b) the manufacturer's instructions;

(c) a document describing:

(i) the materials selected;

(ii) the welding techniques selected;

(iii) the checks selected;

(iv) any pertinent details as to the vessel design.

14. In the case of a schedule relating to two or more vessels of the same family, variations in length of the cylindrical component resulting in modifications of apertures or penetrations must be shown in the drawing for each variant.

15. In the case of a schedule provided pursuant to an application for a certificate under the EC verification procedure or the EC certificate of conformity procedure, it must also comprise:

    (a) evidence of approval by an approved body of the welding techniques employed and of the welders' and operators qualifications;

    (b) the inspection slip, as defined in paragraph 13(b) of Annex C, for the materials used in the manufacture of components and assemblies contributing to the strength of the vessel;

    (c) a report on the examinations and tests performed, or a description of the proposed checks.

EC Verification Procedure

1. The manufacturer must take all the necessary measures for the manufacturing process to ensure that the vessels conform to the type described in the EC type-examination certificate or to the design and manufacturing schedule for which an approved body has issued an EC certificate of adequacy.

2. The manufacturer shall make his vessels available to an approved body in the form of uniform batches, accompanied by the EC type-examination certificate or the design and manufacturing schedule and in the latter case the approved body shall, prior to EC verification, examine the schedule in order to certify its conformity.

3. When a batch is examined a United Kingdom approved body must:

   - ensure that the vessels have been manufactured and checked in accordance with the design and manufacturing schedule;

   - carry out a specified hydrostatic or pneumatic test on each vessel in the batch and specified tests of weld quality;

   - for vessels designed in accordance with the experimental method described in Annex C, paragraph 9, these tests on test-pieces shall be replaced by a hydrostatic test on five vessels taken at random from each batch in order to check that they conform to the requirements of the said paragraph 9.

Certificate of Conformity issued under the verification procedure

4. In the case of accepted batches the approved body shall affix, or cause to be affixed, its identification number to each vessel and draw up a certificate of conformity relating to the tests carried out. Provided that the manufacturer may, under the responsibility of the approved body, affix the latter's identification number during the manufacturing process.

5. In the case of accepted batches all vessels in the batch may be placed on the market except for those which have not successfully undergone a hydrostatic test or a pneumatic test.

Declaration of conformity

6. The manufacturer or his authorised representative established within the Community ensures and declares that the vessels which have been checked by the approved body are in conformity to the type described in the EC type-examination certificate or with the design and manufacturing schedule and shall affix the CE Marking to each vessel and draw up a declaration of conformity.

Rejection of a batch

7. If a batch is rejected by an approved body it shall take appropriate measures to prevent the putting on the market of that batch, and in the event of frequent rejection of batches, the approved body may suspend the statistical verification.

EC Certificate of Conformity Procedure

1. In cases where the manufacturer of vessels in Category A.2 or A.3 elects not to apply for a certificate of conformity under the EC verification procedure, he may instead apply to follow the EC certificate of conformity procedure. Application for an EC certificate of conformity under this procedure must, before commencement of series manufacture, be made to the approved body which issued the relevant EC certificate of adequacy or EC type-examination certificate. The application must be accompanied by the design and manufacturing schedule and a document which:

   - describes the processes by which the vessels are to be manufactured;
   - describes all the measures which are to be taken to ensure that the vessels when manufactured conform with a relevant national standard or with the relevant prototype;
   - specifies the address of any place where the vessels (or relevant assemblies incorporating the vessels) are to be manufactured or stored by or on behalf of the manufacturer of the vessels, and the proposed date of commencement of manufacture;
   - specifies the tests to be carried out in the course of manufacture, and the procedures by which and the frequency with which they are to be performed;
   - includes undertakings that:
     - those tests will be carried out as specified;
     - a specified hydrostatic or pneumatic test will be carried out on each vessel;
     - all the tests will be carried out by or under the responsibility of appropriately qualified personnel (who must be sufficiently independent from production personnel) and will be subject to written reports by those personnel.

EC Certificate of Conformity

2. The United Kingdom approved body shall, if satisfied:

   - that the document and schedule contain all the required information; and
   - that vessels manufactured in accordance with the document and schedule will conform with the relevant national standard or, if not, then with the essential safety requirements specified in Annex A;

   issue an EC certificate of conformity accordingly, covering the vessels proposed to be manufactured

Declaration of conformity

3. A manufacturer who has obtained an EC certificate of conformity as part of this procedure may commence series manufacture and apply the CE marking to vessels which he declares to be in conformity:

   - to the design and manufacturing schedule on which a certificate of adequacy has been drawn up; or

   - the relevant approved prototype.

Refusal of an EC Certificate of Conformity

4. If the United Kingdom approved body is not satisfied as required and refuses to issue an EC certificate of conformity, it shall make known in writing to the manufacturer the reasons for the refusal.

How to obtain safety clearance