Guidelines **5/18/07**

8. Other ESRs

Guideline 8/1

[Original version as adopted on: *29 Jan 1999*]

Pressure equipment directive 97/23/EC
Commission's Working Group "Pressure"

Guideline related to:

Question: In the linguistic versions of the directive the symbol for the unit for volume (litre) is not consistent (big L, small l). Which symbol should be used?

Answer: The big "L" should be used. This should be taken into account by the Member States when transposing the directive.

Reason: In the field of pressure equipment the symbol for litre is mainly used in connection with numbers. The letter "l" and the figure "1" look often identically so that misunderstandings between figures and the symbol can occur. Often the marking on nameplates is stamped so it is important that the symbol is easy readable.

Accepted by WPG on: **12 Oct 1998**

Accepted by Working Group "pressure": **29 Jan 1999**

Remarks:

Guideline 8/2

[Original version as adopted on: *08 Nov 1999*]

Pressure equipment directive 97/23/EC
Commission's Working Group "Pressure"

Guideline related to: **Annex I Section 3.2.2** , **Annex I Section 7.4**

Question: Final assessment (Annex I, section 3.2.2) of pressure equipment must include a test for pressure containment at a pressure at least equal, where appropriate, to the value laid down in section 7.4. This section only refers to pressure vessels. Does this mean that 7.4 does not apply to piping, and pressure and safety accessories ?

Answer: In accordance with Annex I, 3.2.2 in the course of the final assessment pressure equipment must be subjected to a test for the pressure containment aspect. As a rule, this test for the pressure containment aspect is supposed to be carried out in the form of a hydrostatic pressure test. Where this is not possible or disadvantageous other procedures are permissible.
The pressure value chosen for carrying out a hydrostatic pressure test must be such as to assure testing the pressure containment aspect of the

pressure equipment with due consideration of the determined safety factors without causing a damage to the pressure equipment. Annex I, 7.4 provides additional formulas which may be applied only in due consideration of the above described general criteria (3.2.2). The formulas in Annex I, section 7.4 should be considered for all items of pressure equipment, not only pressure vessels.

Accepted by WPG on: **16 Jul 1999**

Accepted by Working Group "pressure": **08 Nov 1999**

Remarks:

Guideline 8/3

[Original version as adopted on: *30 Jun 2000*]

Pressure equipment directive 97/23/EC
Commission's Working Group "Pressure"

Guideline related to: Annex I Section 3.3 , Annex I Section 3.4

Question: What safety information must be given to the user in relation to Annex I points 3.3 and 3.4 ?

Answer: When pressure equipment is placed on the market, the manufacturer is required by the PED to ensure that it is accompanied by instructions for the user containing certain safety information ; such information is mandatory. Additional information may be requested by the user or recommended by the manufacturer, and agreed as part of the order or contract ; this information is not a PED requirement and therefore is optional. Both types of information are elaborated below.

The following are **required by the PED :**

- Details accompanying the CE mark, per clause 3.3a, 3.3b and 3.3c
- Operating instructions for mounting, putting into service, use and maintenance, per clause 3.4a, which include as far as relevant to the equipment:

- safe operating limits and design basis (includes anticipated operating and assumed design conditions, intended life, design code used, joint coefficients and corrosion allowances)
- features of the design relevant to the life of the equipment per clause 2.2.3b last indent
- residual hazards not prevented by design or protective measures, that might arise from foreseeable misuse, per clause 1.3, 3.3c, and 3.4c
- technical documents, drawings and diagrams necessary for a full understanding of these instructions, as per clause 3.4b
- information about replacable parts, for example per clause 2.7

NOTE: Without prejudice of clause 3.4a, other information, **not required by the PED**, may be included by contractual agreement, such as : hazard analysis, material test certificates, detailed design calculations, "as built" drawings, heat treatment records, welding records, NDT results, results of dimensional check, full records of proof test, details and results of special checks, details of any corrective repair or modifications, full documentation of any concessions made.

Accepted by WPG on: **04 May 2000**

Accepted by Working Group "pressure": **30 Jun 2000**

Remarks:

Guideline 8/4

[Original version as adopted on: *08 Nov 1999*]

Pressure equipment directive 97/23/EC
Commission's Working Group "Pressure"

Guideline related to: Annex I

Question: What shall be the extent of the hazard analysis specified in the third preliminary observation of Annex I ?
How shall it be documented ?

Answer: The hazard analysis shall enable the manufacturer to identify and to determine the potential modes of failure due to loading of pressure equipment which could occur when this equipment is installed and used in reasonably foreseeable operating conditions.

After the manufacturer has fixed the limits of the equipment, he must complete a hazard analysis which will enable him to identify the essential requirements which are applicable to the equipment.

The results of this analysis (applicable essential requirements in relation to the foreseeable operating conditions) shall be included in the technical documentation, but the inclusion of full details of the analysis in the documentation is not required by PED.

Accepted by WPG on: **02 Sep 1999**

Accepted by Working Group "pressure": **08 Nov 1999**

Remarks:

Guideline 8/5

[Original version as adopted on: *08 Nov 1999*]

Pressure equipment directive 97/23/EC
Commission's Working Group "Pressure"

Guideline related to: Annex I Section 3.4

Question: Does the strength of the foundations (concrete plates, tightened gravel, piling etc), where the pressure equipment is erected, belong to the details to be considered under PED?

Answer: The strength of the foundations does not belong to the details to be checked by notified bodies in modules B1, G etc. But the manufacturer, obliged by

section 3.4 of Annex I of PED, must give relevant information (support forces etc) so that the body responsible for installation of the pressure equipment can design the grounding (see Annex I, section 2.2.1).

NOTE: This information should also be made available to the user with ´as built´ drawings, see guideline **8/3**

Accepted by WPG on: **03 Sep 1999**

Accepted by Working Group "pressure": **08 Nov 1999**

Remarks:

Guideline 8/6

[Original version as adopted on: *07 Nov 2000*]

Pressure equipment directive 97/23/EC
Commission's Working Group "Pressure"

Guideline related to: Annex I Section 7

Question: The first paragraph Annex I section 7 explicitly provides for exceptions to the general rules specified subsequently. How should the achievement of "an equivalent overall level of safety" in such a case be demonstrated?**(GL revised 23-May-2002)**

Answer: The specific quantitative requirements given in section 7 of Annex I are related to particular failure modes. If different values are used, the corresponding failure modes and their combination shall be identified and the measures taken to maintain an equivalent level of safety shall be provided in the technical documentation, with appropriate justifications.

The achievement of "an equivalent overall level of safety" may be assumed if the measures taken provide adequate safety margins against all relevant failure modes in a consistent manner. Safety margins are adequate, and deviation from a particular value is justified :

a) by a reduced risk in the respective failure mode, or

b) by additional means to ensure no increase of the risk.

When using a harmonised standard for pressure equipment which has been published in the Official Journal of the European Communities, no further justification is needed for the quantitative values which have been used as regard Annex I section 7 .(refer also to guideline **7/1**)

The requirement to demonstrate an equivalent overall level of safety applies to the product itself, and to the measures taken to meet the essential safety requirements. The use of a "recognised" code is not, in itself, sufficient to demonstrate an equiva-lent overall level of safety .(refer also to guideline **9/5**)

Accepted by WPG on: **10 Apr 2002**

Accepted by Working Group "pressure": **23 May 2002**

Remarks:

Guideline 8/7

[Original version as adopted on: *19 Oct 2001* and modified on *15 Jun 2004*]

Pressure equipment directive 97/23/EC
Commission's Working Group "Pressure"

Guideline related to: **Article 1 Paragraph 2.2** , **Article 1 Paragraph 2.3** , **Annex I Section 1.1** , **Annex I Section 1.3** , **Annex I Section 2.2.1**

Question: What conditions should be considered to determine the maximum allowable pressure PS of an equipment?

Answer: All the reasonably foreseeable conditions shall be taken into account, which occur during operation (starting, operation, stop) and standby (storage, transport, maintenance, emptying, blanketing or inerting).

Note 1: The operating instructions shall identify the reasonably foreseeable hazards arising from misuse which were not possible to eliminate during the design (see Annex I section 1.3).

Note 2: The maximum allowable pressure is used to determine the test pressure, not vice versa.

Note 3: "Pressure related to atmospheric pressure", as defined in Article 1 paragraph 2.2, is the pressure inside the envelope. It shall not be interpreted as "differential pressure between atmospheric pressure and absolute pressure prevailing inside the equipment" for the purposes of classification.

Example: Blanketing (inerting) at more than 0,5 bar of an equipment which operates at less than 0,5 bar will have the consequence of including the equipment in the scope of the directive, if not otherwise excluded.

Accepted by WPG on: **29 Nov 2000**

Accepted by Working Group "pressure": **07 Sep 2004**

Remarks:

Guideline 8/8

[Original version as adopted on: *19 Oct 2001*]

Pressure equipment directive 97/23/EC
Commission's Working Group "Pressure"

Guideline related to: **Article 9 Paragraph 1** , **Article 9 Paragraph 2** , **Annex I Section 3.3**

Question: What does "product group" mean?

Answer: "Product group" is not defined in the directive but in the context of Article 9 paragraphs 1 and 2 it shall be taken to mean the "fluid group" which is used for the purposes of classification.

Note: Moreover, for equipment designed for a specific fluid, the manufacturer shall indicate, where necessary, in order to draw the attention of the user, the name of the fluid on the equipment and in the operating instructions (annex I section 3.3 b and annex I section 3.4 respectively).

Accepted by WPG on: **29 Nov 2000**

Accepted by Working Group "pressure": **19 Oct 2001**

Remarks:

Guideline 8/9

[Original version as adopted on: *28 Feb 2002*]

Pressure equipment directive 97/23/EC
Commission's Working Group "Pressure"

Guideline related to: **Annex I Section 3.3**

Question: Must an individual serial number always be provided, even if the items of pressure equipment are manufactured in batches or series?

Answer: No.

For items of pressure equipment manufactured in batches or series (such as portable extinguishers or valves) the identification may be limited to the batch or series number. It is not always necessary to provide an individual serial number on each item of pressure equipment.

Notes:

1. When a national authority applies the safeguard clause the decision will relate to all products belonging to the same batch or series. Similarly if a manufacturer withdraws non-compliant or defective products from the market this will relate to all products belonging to the same batch or series.

2. It should be noted that some linguistic versions are unclear on this point.

3. Sufficient identification shall be possible according to the nature of the equipment.

Accepted by WPG on: **22 Nov 2001**

Accepted by Working Group "pressure": **28 Feb 2002**

Remarks:

Guideline 8/10

[Original version as adopted on: *28 Feb 2002*]

Pressure equipment directive 97/23/EC
Commission's Working Group "Pressure"

Guideline related to: Article 3 Paragraph 1.2 , Annex I Section 3.3

Question: Does the directive require a specific format for marking the year of manufacture of pressure cookers?

Answer: No.

The year of manufacture could be for example given as a 4-digit (year of manufacture : yyyy) or limited to 2 digits, associated with the serial number (xxxx/yy).

Accepted by WPG on: **18 Dec 2001**

Accepted by Working Group "pressure": **28 Feb 2002**

Remarks:

Guideline 8/11

[Original version as adopted on: *03 Oct 2002*]

Pressure equipment directive 97/23/EC
Commission's Working Group "Pressure"

Guideline related to: Annex I

Question: For products built according to a harmonized standard, is the manufacturer still obliged to perform the hazard analysis required by Annex I preliminary observation 3 of the PED?

Answer:

YES

The manufacturer has :

- first to identify the hazards;

- second to determine those essential safety requirements (ESRs) which apply to his product.

Then, a comparison with Annex ZA of an existing harmonized standard will allow him to decide whether this standard fully covers the relevant ESRs for his product.

See also Guideline **8 / 4**.

Accepted by WPG on: **18 Jun 2002**

Accepted by Working Group "pressure": **03 Oct 2002**

Remarks:

Guideline 8 / 12

[Original version as adopted on: *27 Jan 2003*]

Pressure equipment directive 97 / 23 / EC
Commission's Working Group "Pressure"

Guideline related to: Annex I Section 3.3

Question: Which are the essential maximum/minimum allowable limits to be marked according to Annex I section 3.3 a) of Pressure Equipment Directive(PED)?

Answer: All pressure equipment shall be marked with the maximum allowable pressure PS.
Depending on the type of pressure equipment, its operating conditions and the results of hazard analysis there may be other essential maximum/minimum allowable limits or combinations thereof, such as
- maximum or minimum allowable temperature;
- maximum or minimum fluid level.

Note: Further information may be required (see PED Annex I sections 3.3.b and c).

Accepted by WPG on: **05 Nov 2002**

Accepted by Working Group "pressure": **27 Jan 2003**

Remarks:

Guideline 8 / 13

[Original version as adopted on: *03 Nov 2003* and modified on *28 Jun 2005*]

Pressure equipment directive 97 / 23 / EC
Commission's Working Group "Pressure"

Guideline related to: Annex I Section 3.3 , Annex VI

Question:
Which provisions are to be followed for the CE marking of small pressure accessories and safety accessories, the dimensions of which do not allow fulfilment of the requirements of:

- annex I, section 3.3.a) about the minimum information required,
- annex VI about the minimum size of the CE marking of 5 mm.

Answer: Where these requirements are a physical impossibility, the marking may be given on a label attached to the accessory.

For example if a safety accessory has an external diameter of 8 mm and an internal diameter of 3,7 mm, the whole marking is given on a label.

Reason:
Even though the 2nd indent of the last paragraph of section 3.3 of Annex I refers only to the information under 3.3.b) to be given on a label, in case of technical impossibility it is allowed to give all the information on a label as provided for in the Guide for the New Approach Directives.

Accepted by WPG on: **14 May 2003**

Accepted by Working Group "pressure": **03 Nov 2003**

Remarks:

Guideline 8/14

[Original version as adopted on: *19 Jan 2005*]

Pressure equipment directive 97/23/EC
Commission's Working Group "Pressure"

Guideline related to: Annex I Section 3.2.2

Question: Is it possible to undertake statistical proof testing of series-produced safety valves?

Answer: Yes, when the body of the safety valve classified according to Annex II section 3 does not exceed category I and subject it is supported by the hazard analysis.

Reason:
The proof test is intended to verify the pressure containment aspect of the item of pressure equipment. The proof test does not address the safety function which is covered by Annex I section 2.11.1.

Note 1:
The safety function of such safety valves needs to be assessed according to category IV (except for safety valves manufactured for specific equipment of category lower than IV).

Note 2:
The same reasoning is not applicable to the other items of pressure equipment which are classified by the PED in a higher category than the category derived from their intrinsic characteristics.

Accepted by WPG on: **16 Dec 2004**

Accepted by Working Group "pressure": **19 Jan 2005**

Remarks: Revised 19-Jan-2005

Guideline 8/15

[Original version as adopted on: *25 Feb 2004*]

Pressure equipment directive 97/23/EC
Commission's Working Group "Pressure"

Guideline related to: **Annex I Section 1.1** , **Annex I Section 1.2** , **Annex I Section 1.3** , **Annex I Section 2.9** , **Annex I Section 2.10** , **Annex I Section 2.11**

Question: How should the ESRs (essential safety requirements) of Annex I be interpreted in regard of boilers for generating steam or superheated water intended for operation without continuous supervision?

Answer: All the ESRs from Annex I apply if the corresponding hazards exist. The following observations, which are **not necessarily exhaustive**, explain how some of the ESRs can be understood in the context of operation without continuous supervision.

ESRs	Explanation
1.1	The boiler shall be able to operate automatically, and include a control mode "operation without continuous supervision".
1.3, 5a	The heating system shall be able to operate only if all the boiler safety systems are operational.
2.10	Protection against exceeding allowable limits on pressure, temperature and water level shall be ensured by safety accessories (see also guideline **1/43**)
2.10	When specific aspects of water quality are subject to rapid variation giving rise to dangerous situations within the period of unattended operation, protection against exceeding such limit shall be ensured by safety accessories.
2.10	Adequate monitoring devices, which enable adequate action to be taken automatically to keep the boiler within the allowable limits, shall be provided.
2.10	Warning devices, such as indicators or alarms, which enable the origin of anomalies to be displayed, shall be provided.
2.10	In the case of failure of the power supply to electrical boilers a safe shutdown or continuous operation of the control circuit of the boiler shall be ensured .
2.11	Safety accessories shall be designed to cause a safe shutdown of all or part of the boiler, in case of failure of their power supply.
2.11.1	If for certain operations, the boiler shall be able to operate with some safety accessories neutralised, this shall simultaneously disable the control mode "operation without continuous supervision".
3.4, 1.2	The instructions for use shall explicitly state that the boiler is designed and equipped to be operated without continuous supervision. It shall inform of residual hazards and special measures to be taken during operation to eliminate them. It shall state: - how to test the safety accessories (logic diagram for instance) and what are the recommended intervals for such inspections; - the requirements for boiler feedwater;

	- the instructions to restart the boiler, for every stop origin.
5a	After a boiler shutdown caused by anomaly, the boiler shall not be able to restart automatically.
5d	After shutdown, residual heat shall be safely removed without human intervention.
5e	After a heating system has been locked in the stop position due to failure in its supply, a manual reset shall be necessary to unlock it.

The following examples are frequently used requirements to check the function of the safety system periodically as stated in guideline **9/20**. The requirements are related to ESRs section 5 and section 2.11.1 of Annex I :

24 hours operation without continuous supervision is permitted if functional tests of the limiting devices are carried out periodically at adequate intervals.

A functional test carried out by the boiler attendant includes the shut down of the burner-valves, or, when the boiler is fed by solid fuels, the stopping of the conveyor system. This functional test also includes checking of the quality of water. Member states may have specific requirements to allow duration greater than 24 hours, e.g. provision of a device for automatic monitoring of water quality.

Accepted by WPG on: **25 Feb 2004**

Accepted by Working Group "pressure": **18 Mar 2004**

Remarks: Guideline also related to: Annex I , Section 3.4 and Section 5.

Guideline 8/16

[Original version as adopted on: *19 Jan 2005*]

Pressure equipment directive 97/23/EC
Commission's Working Group "Pressure"

Guideline related to: Annex I Section 3.2.2 , Annex I Section 7.4

Question: If the hydrostatic pressure test required by Annex I section 3.2.2 is replaced by a pneumatic pressure test because filling with water is harmful or impractical, what value has to be used for the pressure test?

Answer: Either the values given in Annex I section 7.4 are to be used for the pneumatic pres-sure test or the manufacturer has to achieve an equivalent level of safety using other appropriate means.

See guideline **8/2**

Note 1:
Whether the test is pneumatic or hydrostatic, when the value of the pressure deviates from the value of Annex 1 section 7.4, additional measures must be applied to verify the pressure containment aspect including tightness (see guideline **5/3**)

Note 2 :
Attention is drawn to the fact that pneumatic testing can be highly dangerous. Refer-ence should be made to the appropriate national authorities for regulation or guidance on the procedures to be followed.

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Remarks:

Guideline 8/17

[Original version as adopted on: *19 Jan 2005*]

Pressure equipment directive 97/23/EC
Commission's Working Group "Pressure"

Guideline related to: Article 15 Paragraph 2 , Annex I Section 3.3

Question: Is it possible to provide the marking and labelling required by Annex I section 3.3 on a sticker?

Answer: Yes, provided the sticker is non-removable, indelible, legible and firmly attached to the pressure equipment, for the intended lifetime and foreseeable conditions of use.

Note :
When using stickers, account has to be taken of limited durability in practice. For most types of pressure equipment, industrial practice is to use rigid data plates.

See also guideline **8/13**.

Accepted by WPG on: **06 Oct 2004**

Accepted by Working Group "pressure": **19 Jan 2005**

Remarks: