Guidelines **5/18/07**

2. Classification and Categories

Guideline 2/1

[Original version as adopted on: *28 Jan 1999*]

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

Guideline related to: **Article 3 Paragraph 1.4** , **Annex II Section 3**

Question: There is a contradiction between the requirements in article 3 paragraph 1.4 and those in annex II point 3.
Can pressure accessories be classified as "article 3.3" as indicated in the tables in annex II or must all of them satisfy the essential requirements as indicated in article 3 paragraph 1.4?

Answer: In accordance with annex II point 3, pressure accessories have to be classified using the appropriate table(s) of annex II on the basis of their PS, their V and/or DN, and the group of fluids for which they are intended. Pressure accessories with low PS, volume and/or DN will therefore fall under the requirements of article 3.3. Such pressure accessories do not have to satisfy the essential requirements but only sound engineering practice.

Reason: Requirements in annex II are more precise and should prevail.

When the directive was developed, it was clearly not the intention to require that all pressure accessories intended for equipment which have to satisfy the essential requirements also have to satisfy those requirements.

---Reservation from Sweden.

Accepted by WPG on: **13 Oct 1998**

Accepted by Working Group "pressure": **28 Jan 1999**

Remarks:

Guideline 2/2

[Original version as adopted on: *28 Jan 1999*]

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

Guideline related to: **Article 1 Paragraph 2.6** , **Article 3 Paragraph 1.3**

Question: The Directive uses the notion of DN (defined in Article 1, paragraph 2.6) for the classification of piping or piping accessories (cf. Article 3, paragraph 1.3). How to apply the Directive for classifying the tubular products or accessories for which the notion of DN does not exist (copper tubes, plastic valves, hollow sections....)?

Answer: In the absence of DN in the standards, it shall be assumed that DN corresponds to the internal diameter in millimetres for circular products or the diameter in millimetres of the equivalent flow section for non-circular products.
For non-circular piping a comparative diameter must be determined from the existing cross-section. This comparative diameter must be used as the basis for classification.

Accepted by WPG on: **13 Oct 1998**

Accepted by Working Group "pressure": **28 Jan 1999**

Remarks:

Guideline 2/3

[Original version as adopted on: *28 Jan 1999*]

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

Guideline related to: Article 3 Paragraph 1 , Annex II

Question: How should vessels and piping for superheated water be classified? **(GL revised on 10-Apr-2002)**

Answer: Vessels for super-heated water are covered by article 3, paragraph 1.1 a), second dash and table 2 applies.

Piping for super-heated water is covered by article 3, paragraph 1.3 a), second dash and table 7 applies.

These replies are applicable to unheated vessels or pipes with temperatures > 110° C.

Fired or otherwise heated vessels or piping with maximum allowable temperatures > 110° C that are designed to produce steam or superheated water are covered by article 3, paragraph 1.2 and table 5 applies.

Accepted by WPG on: **27 Nov 1998**

Accepted by Working Group "pressure": **28 Jan 1999**

Remarks:

Guideline 2/4

[Original version as adopted on: *07 Sep 2004* and modified on *16 Mar 2005*]

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

Guideline related to: **Article 1 Paragraph 2.1.1** , **Article 1 Paragraph 2.1.2**

Question: Which type of pressure equipment is a heat exchanger ?

Answer: Heat exchangers are considered to be vessels.
As an exception, heat exchangers which consist of straight or bent pipes which may be connected by common circular header(s) made also from pipe are classified according to Article 1 paragraph 2.1.2 last sentence as piping if, and only if, the 3 following conditions are met:

- air is the secondary fluid,
- they are used in refrigeration systems, in air conditioning systems or in heat pumps,
- the piping aspects are predominant.

For such heat exchangers with headers, the piping aspects are pre-dominant if $Cat_p \geqslant Cat_v$ where:

Cat^p = Abstract category that would be applicable according to 97/23/EC if the heat exchanger were classified as piping using DN of the biggest header.

Cat^v = Abstract category that would be applicable according to 97/23/EC if the biggest header, without the connecting piping, were classified as a vessel (i.e. for determining Cat_v, not the total volume V of the heat exchanger is taken into account, but only the volume VH of the biggest header).

When the result is Catv>Catp, the appropriate vessel classification shall be determined by using the volume of the entire heat exchanger (headers plus connecting tubes).

Note: Piping heat exchangers which do not meet the requirements of the exception are not to be classified according to the last sentence of Article 1 paragraph 2.1.2 as piping; they are to be classified as vessels. For example:

- Heat exchangers which are not used in refrigeration systems, in air conditioning systems or in heat pumps, and for which the main purpose is to heat or cool the contained fluid by using the surrounding air;
- Half-pipe coil or a similar « jacket » construction that heat or cool a vessel;
- Pipe coil that is inside a vessel to heat or cool its content.

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

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

Remarks: Swedish reservation on the determination of Catv based only on the biggest header and not on the sum of the header volumes, and on the inclusion "refrigeration systems" and condensers in the second indent of the answer.

Guideline 2/5

[Original version as adopted on: *24 Mar 2000* and modified on *18 Apr 2007*]

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

Guideline related to: **Article 1 Paragraph 2.4** , **Annex II Table T5**

Question: Some warm water generators having a volume greater than 2 L are intended to generate water at a temperature less than 110 °C, but are fitted with a safety temperature limiter which is set to a temperature of 120 °C.
What value of maximum allowable temperature, TS, shall be declared by the manufacturer ?

Answer: If the equipment is designed to operate at a temperature up to, but not exceeding 110 °C, then 110 °C shall be the value of TS, as defined in Article 1.2.4, specified by the manufacturer. In this case, the temperature limiter shall be set to ensure that the water temperature will not exceed 110 °C.

In the example given in the question, TS is 120 °C.
See also guideline **2/12**.

Accepted by WPG on: **22 Nov 2006**

Accepted by Working Group "pressure": **24 Mar 2000**

Remarks:

Guideline 2/6

[Original version as adopted on: *24 Mar 2000*]

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

Guideline related to: **Article 3 Paragraph 1.1** , **Article 3 Paragraph 2.1** , **Article 3 Paragraph 2.2**

Question: How should a fired or otherwise heated equipment be classified if a fluid other than water is being heated ?.

Answer: This equipment shall be considered as vessel in accordance with article 3.1.1 of the directive. It may also be considered as assembly in accordance with article 3.2.2.

The definition of assemblies in article 3.2.1 concerns only the assemblies intended for generating steam or superheated water and does not concern equipment where a fluid other than water is heated..

As a consequence, the classification shall not be made using table 5.

Examples of such equipment are oil heating furnaces, heat exchangers (refer also to guideline **2/4**), and induction heaters.

NOTE: The essential requirements of annex I section 5 are applicable to such pressure equipment, if it presents a risk of overheating, unless the

equipment is covered by Article 3.3.

Accepted by WPG on: **17 Feb 2000**

Accepted by Working Group "pressure": **24 Mar 2000**

Remarks:

Guideline 2/7

[Original version as adopted on: *19 Jan 2005* and modified on *31 Mar 2006*]

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

Guideline related to: Article 9 Paragraph 2.1 , Article 9 Paragraph 2.2

Question: Article 9 classifies fluids with reference to Article 2 (2) of Directive 67/548/EEC. Does this mean that all fluids classified as dangerous are group 1?

Answer: NO, only those fluids the properties of which are cited in Article 9 paragraph 2 of the Pressure Equipment Directive (PED) are to be classified as group 1. According to the classification of Annex VI of the latest amendment of Directive 67/548/EEC they have one or more of the following risk phrases. (This list relates to the version dated November 2005)

- R2, R3 for explosive
- R12 for extremely flammable
- R11, R15, R17 for highly flammable
- R26, R27, R28, R39 for very toxic
- R23, R24, R25, R39, R48 for toxic
- R7, R8, R9 for oxidising.

For flammable fluids, see guideline **2/20**.

Note 1:
The reference to the directive 67/548/EEC is used for the definitions of the risks of the substances. Annex I of this directive is not exhaustive whatever the version is. The fact that a substance is not listed in Annex I of this directive does not imply its classifica-tion in Group 1 or 2. It is advisable then to refer to the safety data sheet supplied with the product in accordance with the directive 91/155/EEC to identify whether the risks of Group 1 are included or not. The classification of substances according to directive 67/548/EEC may also be checked on the website of the European Chemical Bureau http://ecb.jrc.it
Note 2:
Fluids which have the symbol T or T+ are not necessarily group 1. As an example, fluids that are classified carcinogenic may have the symbol T. However, they don't be-long to Group 1 fluids of the PED because they are not classified toxic (e.g. 2-naphtylamine salts, index no. 612-071-00-0). In directive 67/548/EEC, the symbols and classification are not the same. The symbols are defined in article 6 of Directive 67/548/EEC (article 16 of amendment 79/831/EEC) and this article is not mentioned in Article 9 of the PED. Classification and symbols are listed separately in the lists of fluids, Directive 93/21/EEC, and amendments.

Accepted by WPG on: **28 Nov 2005**

Accepted by Working Group "pressure": **31 Mar 2006**

Remarks:

Guideline 2/8

[Original version as adopted on: *24 Mar 2000*]

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

Guideline related to: **Article 9 Paragraph 3**

Question: How should a vessel which is intended to contain water below 100 °C be classified when there is a marginal gas cover ?

Answer: This type of vessel is classified according to Table 4, provided the gas is being continuously removed.

Examples of such vessels are domestic warm water vessels, where entering air is accumulated on the top, and is normally being removed by operation.

Accepted by WPG on: **14 Dec 1999**

Accepted by Working Group "pressure": **24 Mar 2000**

Remarks:

Guideline 2/9

[Original version as adopted on: *24 Mar 2000*]

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

Guideline related to: **Article 3 Paragraph 1.1** , **Article 9 Paragraph 3**

Question: Which pressure and volume values must be used to determine the category of vessels used as gas-loaded accumulators, or other vessels with a flexible or non fixed membrane, given that these are made up of two chambers with different fluids?

Answer: The maximum allowable pressure (PS) of the vessel and the total volume of the vessel shall be used according to Article 9.3.

Accepted by WPG on: **14 Dec 1999**

Accepted by Working Group "pressure": **24 Mar 2000**

Remarks:

Guideline 2/10

[Original version as adopted on: *26 Jun 2001*]

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

Guideline related to: **Article 3 Paragraph 1.1** , **Article 9 Paragraph 3**

Question: If a vessel contains a fluid which meets the conditions of the introductory paragraph to Article 3, paragraph 1.1(a) (e.g. air) and a liquid which meets the conditions of the introductory paragraph to Article 3, paragraph 1.1(b) (e.g. water) - how shall the vessel be classified?

Answer: Article 9, paragraph 3 states that the classification shall be on the basis of the fluid which requires the higher category. The total volume (V) of the vessel, as defined in Article 1, paragraph 2.5, shall be used to determine the conformity assessment category, not the actual volume occupied by the individual fluids at any particular time.

See also guidelines **2/8** and **2/9**.

Accepted by WPG on: **20 Feb 2001**

Accepted by Working Group "pressure": **26 Jun 2001**

Remarks:

Guideline 2/11

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

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

Guideline related to: **Article 10 Paragraph 1.4** , **Annex II** , **Annex III**

Question: When is it possible for a manufacturer to apply a module from a higher category and what are the consequences ?

Answer:

Article 10.1.4 states that manufacturers can choose to apply one of the procedures which apply to a higher category if available. The words ?if available? make it clear that if an item of pressure equipment was classified as category IV, then a module from a higher category is not available. Even for those tables in Annex II where categories III and/or IV are not listed, such procedures can be chosen.

The procedures available are the modules or module combinations described under Article 10.1.3.

If a module (or a module combination) from a higher category is chosen, all the requirements of that module must be met, including the marking of the identification number of the Notified body.

However, the use of a module (or a module combination) from a higher category does not change the actual classification of the equipment. The requirements of Annex I are those resulting from the actual classification unless the module itself gives specific requirements.

See also guideline **2/18**.

NOTE: When particular modules are explicitly referenced in the text of the directive, they cannot be substituted, as for example in Table 4 of Annex II.

Accepted by WPG on: **25 Aug 2000**

Accepted by Working Group "pressure": **07 Nov 2000**

Remarks:

Guideline 2/12

[Original version as adopted on: *24 Mar 2000*]

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

Guideline related to: **Article 1 Paragraph 2.4**

Question: For warm water boilers which are controlled by a temperature thermostat and protected by a safety temperature limiter, does the maximum allowable temperature (TS) mean:
(a) the maximum intended operating temperature under normal conditions as controlled by the thermostat; or;
(b) the temperature setting of the ultimate over-temperature safety device i.e. the limiter?

Answer: (b) is correct.

Note: manufacturers must ensure that the equipment is sufficiently robust to deal with any residual heat after activation of the limiter.

See also WPG **2/5**

Accepted by WPG on: **18 Feb 2000**

Accepted by Working Group "pressure": **24 Mar 2000**

Remarks:

Guideline 2/13

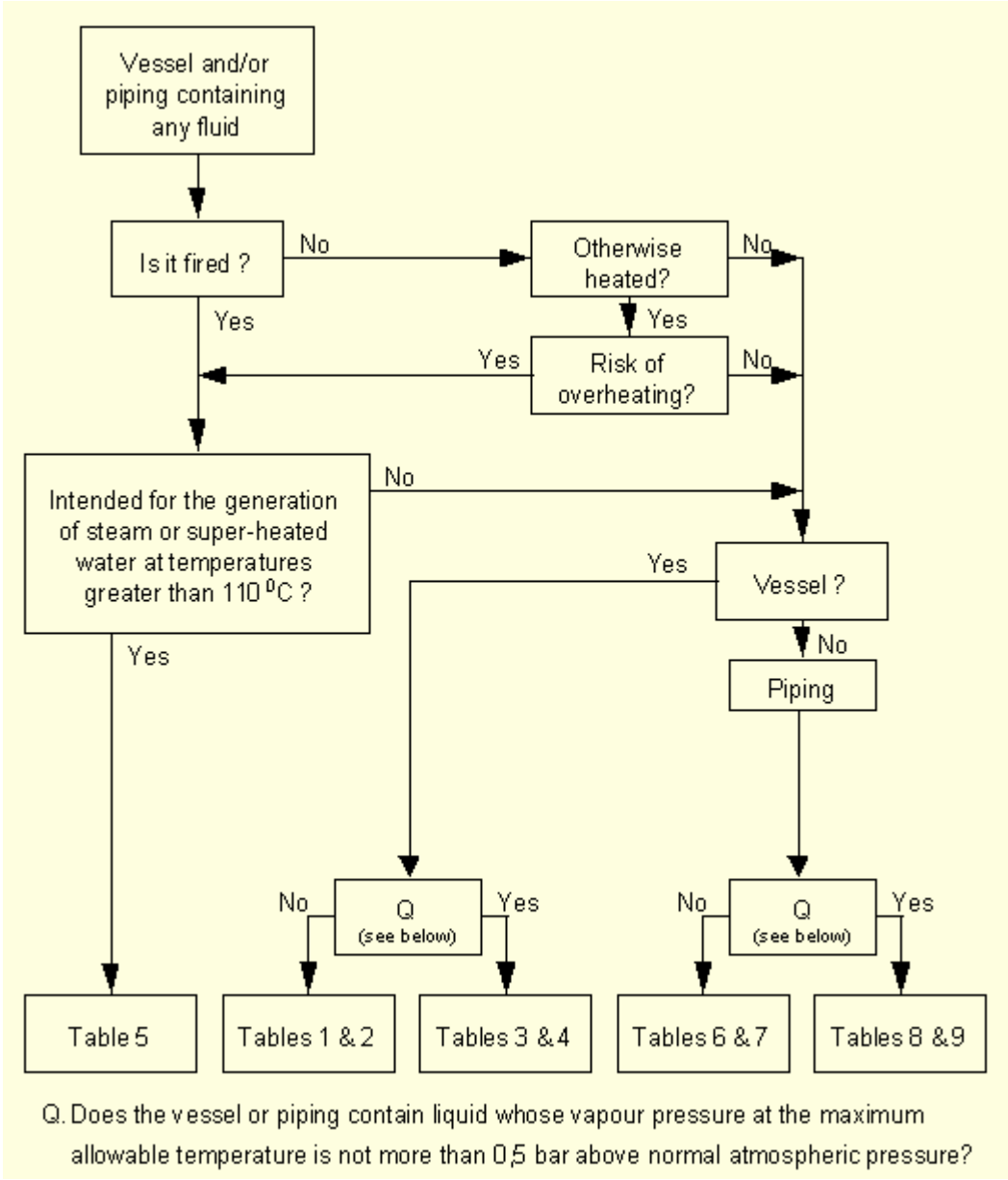
[Original version as adopted on: *29 Jun 2000*]

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

Guideline related to: **Article 3 Paragraph 1.1** , **Article 3 Paragraph 1.2** , **Article 3 Paragraph 1.3** , **Annex II**

Question: How can manufacturers use Article 3.1 to determine the appropriate conformity assessment Tables in Annex II?

Answer:


Vessel and/or piping containing any fluid
Is it fired ?
No
Otherwise heated?
No
Yes
Yes
Yes
Risk of overheating?
No
Intended for the generation of steam or super-heated water at temperatures greater than 110 °C ?
No
Yes
Vessel ?
No
Piping
Yes
No
Q (see below)
Yes
No
Q (see below)
Yes
Table 5
Tables 1 & 2
Tables 3 & 4
Tables 6 & 7
Tables 8 & 9
Q. Does the vessel or piping contain liquid whose vapour pressure at the maximum allowable temperature is not more than 0,5 bar above normal atmospheric pressure?

Accepted by WPG on: **05 May 2000**

Accepted by Working Group "pressure": **29 Jun 2000**

Remarks:

Guideline 2/14

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

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

Guideline related to: Article 3 Paragraph 1.1 , Annex II Table T2

Question: Article 3, section 1.1(a) second indent, states that all portable extinguishers must comply with the essential safety requirements (ESRs) and be assessed according to Annex II, Table 2. In addition, Table 2 states that portable extinguishers must exceptionally be classified at least in category III. To what parts of a portable extinguisher do these requirements apply?

Answer: Article 3, section 1.1(a) and Annex II, Table 2 are applied to vessels and therefore the requirements are relevant to the cylinder (bottle) of the portable extinguisher. The other parts of the portable extinguisher which are pressure equipment are classified according to Article 3 and assessed according to the appropriate Tables.

NOTE: A portable extinguisher is an assembly referred to in Article 1, section 2.1.5 and Article 3, section 2.2. It shall be subjected to a global conformity assessment procedure of Article 10, section 2 and it shall bear the CE marking as an assembly.

The global conformity assessment procedure of Article 10, sections 2 (b) and 2 (c) is determined by the highest category applicable to the equipment concerned other than that applicable to any safety accessories. Because the cylinder (bottle) of a portable extinguisher is classified at least in category III the global conformity assessment procedure to be applied must be chosen among those laid down at least for category III.

Accepted by WPG on: **02 Oct 2000**

Accepted by Working Group "pressure": **07 Nov 2000**

Remarks:

Guideline 2/15

[Original version as adopted on: *27 Feb 2002*]

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

Guideline related to: Article 3 Paragraph 1.2 , Annex II Table T5

Question: Does the classification of the pressure cookers in category III for the assessment of the design mean that also the essential safety requirements are linked to category III?

Answer: No.

In accordance with Article 3 paragraph 1.2, all the pressure cookers shall satisfy the essential safety requirements of the directive and shall bear the CE marking.

The determination of the category of the pressure cookers regarding essential safety requirements following Article 9 paragraph 1 is made in accordance with table 5 of Annex II, i.e. :
- Category I for the pressure cookers for which the product PS.V is not greater than 50 bar.L
- Category II for the pressure cookers for which the pressure is not greater than 32 bar and the product PS.V is over 50 bar.L and not greater than 200 bar.L

The only differences in essential safety requirements with regard to category are stated in Annex I sections 3.1.2, 3.1.3, 3.2.2, 4.2c and 4.3 (see also guideline **2/11**).

The design assessment shall be made in accordance with a module of Category III or IV, i.e. modules B, B1, G, H or H1.

Note : When module B or B1 is used and no notified body is involved at the production phase, there shall be no marking of the identification number of the notified body.

Accepted by WPG on: **19 Dec 2001**

Accepted by Working Group "pressure": **27 Feb 2002**

Remarks:

Guideline 2/16

[Original version as adopted on: *26 Jun 2001* and modified on *18 Apr 2007*]

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

Guideline related to: Article 1 Paragraph 2.1.3 , Annex I Section 2.11

Question: Are pressure regulators safety accessories in the sense of PED?

Answer: In general pressure regulators are pressure accessories.

Only in the case where they fulfil the definition of safety accessory and consequently have a specified safety function, they are to be considered safety accessories and they shall meet requirements of Annex I, section 2.11.

When a pressure regulator is installed in an assembly where the design pressure of the system downstream of the device is lower than the pressure which can occur upstream of the device, and the system downstream is not protected by a safety accessory, the manufacturer of the assembly must ensure that this pressure regulator fulfils the requirements of a safety accessory.

Note: It is foreseeable that some pressure regulators without specific safety function could be inadvertently used as safety accessories. The manufacturer of the pressure regulator must include an appropriate warning in their instructions for use.

Accepted by WPG on: **27 Mar 2007**

Accepted by Working Group "pressure": **26 Jun 2001**

Remarks:

Guideline 2/17

[Original version as adopted on: *26 Jun 2001*]

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

Guideline related to: Article 9 , Annex II Section 3

Question: How are pressure accessories classified?

Answer: The guiding factor should be based on the characteristic of the pressure accessory. In some cases both volume and DN are considered appropriate. In such cases, the pressure accessory must be classified in the highest category.

In the case of valves, DN is normally the more appropriate.

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

See also guideline **2/1**.

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

Accepted by Working Group "pressure": **26 Jun 2001**

Remarks:

Guideline 2/18

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

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

Guideline related to: **Article 3 Paragraph 3** , **Article 10 Paragraph 1.4**

Question: Article 10, section 1.4 states that a manufacturer may choose to apply one of the conformity assessment procedures which apply to a higher (conformity assessment) category if available. Does this mean that a manufacturer of pressure equipment covered by Article 3, section 3, referred to as Sound Engineering Practice (SEP), can choose to apply Module A for example and hence apply a CE Marking?

Answer: No.

Article 9, section 1 deals with the classification of pressure equipment referred to in Article 3, section 1 (not section 3) and Article 10 sets out how the conformity assessment procedures should be determined for such equipment. Therefore Article 10, section 1.4 does not apply to SEP pressure equipment and it does not provide any derogation to the provision in Article 3, section 3 that specifically prohibits CE Marking of SEP pressure equipment.

Accepted by WPG on: **25 Aug 2000**

Accepted by Working Group "pressure": **07 Nov 2000**

Remarks:

Guideline 2/19

[Original version as adopted on: *27 Feb 2002* and modified on *31 Mar 2006*]

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

Guideline related to: **Article 1 Paragraph 2.1.1** , **Article 3 Paragraph 1.1** , **Article 9 Paragraph 1** , **Article 9 Paragraph 3** , **Annex I Section 2.2.3**

Question: Do two housings, designed to contain fluids under pressure and which have a common boundary (e.g. separating wall), constitute two vessels, or two chambers of the same vessel ?

Answer:

They constitute two chambers of the same vessel.

Technical requirements and conformity assessment procedure to be applied are de-termined as follows:

- each chamber will be classified according to Article 3, paragraph 1.1 and Article 9, paragraph 1. This establishes the technical requirements for each chamber.
- the conformity assessment procedure to be applied to the whole vessel is based on the highest category of the chambers.

The technical requirements to be applied to the common boundary are those of the highest category of the two chambers.

Hazard analysis of individual chambers must take account of the effect of any per-ceived hazard on the vessel as a whole.

The marking shall include the limits of the two chambers even if the limits of one chamber do not exceed the limits of Article 3 paragraph 1.1.

Reason: If a vessel is composed of a number of chambers each individual chamber must be first classified. The classification and the technical requirements of each individual chamber are based to Article 3, paragraph 1.1 and Article 9, paragraph 1. The con-formity assessment procedure to be applied to the whole vessel is determined by the highest category.

Examples:

- A refrigerant heat exchanger that has water in tube or shell side,
- A valve body or a pipe with heating or cooling jacket that has a small volume.

NOTE 1: Sound engineering practice can be applied as technical requirement for a chamber that does not exceed relevant limit of Article 3, paragraph 1.1.

NOTE 2: Refer to guideline **1/13** for those cases where maximum allowable pressure of a chamber does not exceed 0,5 bar.

Accepted by WPG on: **05 Jul 2005**

Accepted by Working Group "pressure": **31 Mar 2006**

Remarks: Reservation from Denmark and Sweden.

Guideline 2/20

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

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

Guideline related to: Article 9 Paragraph 2.1

Question: What is meant by "flammable" in article 9 paragraph 2.1, 4th indent of the PED?

Answer:

Flammable means any fluid which is intended to be used at a maximum allowable temperature TS above its flashpoint.

Reason :
Although this is not fully in line with the definition of Directive 67/548/EEC, this answer was clearly the intention of the Council and Parliament, as shown by the sentence between brackets in the text of the PED.

Note 1:
A fluid defined as flammable according to Directive 67/548/EEC does not belong to group 1 in the case the maximum allowable temperature (TS) is below its flashpoint.

Note 2 :
Heat transfer oils are not defined as 'flammable' according to the Directive 67/548/EEC (and its amendments) because their flashpoint is above 55 °C. However, if the maximum allowable temperature (TS) is above flashpoint the hazard of heat transfer oil corresponds with the definition of Article 9, section 2.1, of flammable group 1 fluid.

Accepted by WPG on: **15 Dec 2004**

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

Remarks: Revised 19-Jan-2005

Guideline 2/21

[Original version as adopted on: *23 May 2002*]

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

Guideline related to: **Annex I Section 2.2** , **Annex I Section 2.3** , **Annex II Table T1** , **Annex II Table T6**

Question: Tables 1 & 6 of annex II of PED include a reference to unstable gas (this implies that we should classify the equipment in categories III or IV). How does one define an unstable gas ?

Answer: An unstable gas in this context is a gas or a vapour liable to transform itself spontaneously, producing a sudden pressure increase.

Such transformation as an example can result from a relatively small variation of an operating parameter (e.g. pressure, temperature) in a confined volume.

These substances are generally put on the market in a stabilised form. ADR:2001, chapter 2.2.2.2.1 contains the general criteria for the classification of gases. An indication is given with the notion "stabilised" in tables A and B in chapter 3.2 of ADR:2001.

Typical examples of unstable gases: acetylene (UN 1001), methyl acetylene (UN 1060), vinylfluoride (UN 1860).

Note : Directive 67/548/EEC on classification, packaging and labelling of dangerous substances does not deal with this point.

Accepted by WPG on: **13 Mar 2002**

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

Remarks:

Guideline 2/22

[Original version as adopted on: *23 May 2002*]

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

Guideline related to: Article 3 Paragraph 1.2 , Annex I Section 5

Question: What does overheating mean in Article 3 paragraph 1.2 ?

Answer: Overheating in the sense of Article 3 paragraph 1.2 means exceeding the design temperature, for instance in the case of a failure of a safety system, or through operator error.

Overheating is a hazard which cannot be eliminated through a safety system, but the risk can be minimized.

However if the design temperature is chosen to take into consideration the highest temperature in all foreseeable conditions, the hazard of overheating does not exist.

Note : Design temperature will have to take account of the highest temperature of the material, and not only of the fluid content.

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

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

Remarks:

Guideline 2/23

[Original version as adopted on: *23 May 2002* and modified on *31 Mar 2006*]

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

Guideline related to: Article 3 Paragraph 1.3 , Annex II

Question: How should a solar panel be classified?

Answer:

This pressure equipment shall be considered as a heat exchanger containing super-heated or hot water (with or without additives).

Only when a solar panel in its entirety is designed to withstand the highest possible temperatures (stagnation conditions are within the normal operation range), a risk of overheating does not occur (see guideline **2/22**). As a consequence the classification shall be made using table 2, Annex II (see guideline **2/13**).

See also guideline **2/4**.

Note : A typical solar panel would be classified as Article 3, paragraph 3 equipment, due to the maximum allowable pressure and volume.

Accepted by WPG on: **28 Nov 2005**

Accepted by Working Group "pressure": **31 Mar 2006**

Remarks:

Guideline 2/24

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

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

Guideline related to: Article 1 Paragraph 2.7 , Article 9 Paragraph 3

Question: Article 9, paragraph 3 states that where a chamber contains several fluids, classification shall be on the basis of the fluid which requires the highest category. Can some guidance be provided on how to proceed with the fluid mixture classification?

Answer: When a mixture of fluids contains at least one fluid classified to group 1, the mixture shall be classified to group 1 unless the safety data sheet of the mixture allows its classification to group 2.

A "safety data sheet" is a document established according to Directive 91/155/EC, in application of Directives 67/548/EEC and 99/45/EC (*). It gives all necessary safety information, in particular classification of the hazard properties referred to in Article 9 paragraph 2.1 of PED.

Note: When an equipment is manufactured for a specific application defined by the user, it is normally the user who specifies the fluid to be contained or transported in the pressure equipment. Hence, the user should tell the pressure equipment manufacturer the fluid classification or give necessary details so that the pressure equipment manufacturer can classify the fluid.

(*)
- Council Directive 67/548/EEC of 27 June 1967 on the approximation of laws, regulations and administrative provisions relating to the classification, packaging and labelling of dangerous substances.
- Directive 1999/45/EC of the European Parliament and of the Council of 31 May1999 concerning the approximation of the laws, regulations and administrative provisions of the Member States relating to the classification, packaging and labelling of dangerous preparations.
- Commission Directive 91/155/EEC of 5 March 1991 defining and laying down the detailed arrangements for the system of specific information relating to dangerous preparations in implementation of Article 10 of Directive 88/379/EEC.

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

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

Remarks:

Guideline 2/25

[Original version as adopted on: *04 Oct 2002*]

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

Guideline related to: Annex II

Question: Is it possible to classify pressure equipment in a Category higher than the category resulting from the application of tables in Annex II ?

Answer: No.

The classification of a pressure equipment is based on the following factors :

Type of equipment (vessel, piping, or pressure accessory),
-Type of fluid : gas or liquid,
-Group of fluid : group 1 or 2.

These factors determine the table of Annex II to be used. In the appropriate table, the maximum allowable pressure and the volume for vessels or the maximum allowable pressure and the nominal size DN for piping determines the Category of the equipment.

For example a valve classified as DN 25 can only be Sound Engineering Practice according to Article 3 paragraph 3 and must never be CE-marked (see also guideline **2/17**).

NOTE 1 : The directive exceptionally requires use of a higher Category (for instance vessels for unstable gas, or portable extinguishers), but even then there is no choice of category for the manufacturer.

NOTE 2 : The classification of safety accessories is not covered by the tables of Annex II (see section 2 of Annex II)

NOTE 3 : The PED gives flexibility for a manufacturer to apply a conformity assessment procedure from a higher category, if available (see guideline **2/11**). For Sound Engineering Practice equipment see guideline **2/18**.

Swedish reservation on the example due to guideline 2/1.

Accepted by WPG on: **19 Sep 2002**

Accepted by Working Group "pressure": **04 Oct 2002**

Remarks:

Guideline 2/26

[Original version as adopted on: *28 Apr 2003*]

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

Guideline related to: Article 1

Question: How to classify a vessel which contains a "non-suspended dangerous" solid blanketed by a group 2 gas ?

Answer: It will be classified according to table 2.

Reason:
Article 1 paragraph 2.7 defines fluids as gases, liquids and vapours and covers fluids containing a suspension of solids (see guideline **1/24**). Article 9 in connection with Article 3 only mentions gases, liquids and vapours for classification purposes.

Note:
The characteristics of the solid should be considered as part of the hazard analysis and do not influence the classification of the vessel.

Accepted by WPG on: **05 Mar 2003**

Accepted by Working Group "pressure": **28 Apr 2003**

Remarks:

Guideline 2/27

[Original version as adopted on: *28 Apr 2003*]

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

Guideline related to: Article 9 Paragraph 2.1 , Annex I Section 2.2 , Annex I Section 3

Question: How to classify pressure equipment containing one or more fluids when a chemical or physical reaction takes place therein ?

Answer: The classification shall be determined by the fluid which gives the highest category taking into account the starting, intermediate and final fluids, which could arise from all reasonably foreseeable conditions.

See also guidelines **2/21**and **2/24**.

Accepted by WPG on: **24 Mar 2003**

Accepted by Working Group "pressure": **28 Apr 2003**

Remarks:

Guideline 2/28

[Original version as adopted on: *28 Apr 2003*]

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

Guideline related to: **Article 1 Paragraph 2.1.2** , **Article 3 Paragraph 1.3** , **Annex II**

Question: How shall a "piping" (as defined in Article 1 paragraph 2.1.2), comprising pipes with different DNs, be classified?

Answer: For such a piping the maximum DN used shall be the basis for the classification.

Note: The term a "piping" as used above means an item of pressure equipment, and not an "assembly" as defined in Article 1 paragraph 2.1.5.

Accepted by WPG on: **24 Mar 2003**

Accepted by Working Group "pressure": **28 Apr 2003**

Remarks:

Guideline 2/29

[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 2.10**

Question: A pressure vessel (PS > 0,5 bar) has a vacuum relief valve mounted to protect against collapsing (external pressure) when drained.
Is this valve a safety accessory?

Answer: Yes, if a vacuum relief valve is designed to be fitted to pressure equipment (PS > 0,5 bar) where collapse due to vacuum is possible under reasonably foreseeable conditions. The valve is a safety accessory as defined by Article 1, paragraph 2.1.3 and must be assessed as such.

See also guideline **1/43**).

Note 1:
Only those valves with a direct safety function shall be classified as a safety accessory.

Accepted by WPG on: **15 Dec 2004**

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

Remarks:

Guideline 2/30

[Original version as adopted on: *03 Nov 2003*]

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

Guideline related to: **Article 1 Paragraph 2.7** , **Article 9 Paragraph 2.1** , **Article 9 Paragraph 2.2**

Question: How should a fluid containing a suspension of a solid be classified?

Answer: This classification shall take account of the group of the fluid and of the group of the solid and of the group of the mixture if available.

When the group of the mixture is known according to directive 99/45/EC "Dangerous preparation directive", this group is used for the classification.

If not, the classification is based on the higher group of the fluid and the solid.

See also guidelines **1/24**, **2/24**, **2/26**, **2/27**.

Reason:
Article 1.2.7 of the PED stipulates that a fluid may contain a suspension of solids. The directive 67/548/EEC referenced in article 9 of the PED addresses "substances", defined as "chemical elements and their compounds as they occur in the natural state or as produced by industry" and "preparations", defined as "mixtures or solutions composed of two or more substances", i.e. its scope is not limited to "pure fluids". Article 3 of the directive 67/548/EEC provides the classification to be performed according to the greatest degree of hazard.

Note:
When a solid is suspended in a fluid the risk of the release of solid particles by a pressure accident is substantially higher than in case of a solid block blanketed by a fluid (case of guideline **2/26**). This supports the different conclusions of this guideline and guideline 2/26.

When the solid particles are big enough that the release of solid particles cannot be expected in case of a pressure accident, then guideline 2/26 applies.

Accepted by WPG on: **15 May 2003**

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

Remarks:

Guideline 2/31

[Original version as adopted on: *17 Mar 2004*]

Pressure equipment directive 97/23/EC

Commission's Working Group "Pressure"

Guideline related to: **Article 1 Paragraph 2.1.2** , **Article 1 Paragraph 2.1.4**

Question: How to consider, in application of the Pressure Equipment Directive (PED), piping components connected together and connected also to valves, and which are the provisions for the placing on the market ?

Answer: The PED makes the distinction in article 1 paragraph 2 between pressure equipment (vessel, piping, safety accessory and pressure accessory) and assemblies.

Connecting together piping components (flanges, pipes, fittings, reducers for example) constitutes an *"item of piping"* (see also guideline **1/9**). The valves are pressure accessories, and not components of piping.

An item of piping, of category I and above, shall be placed on the market with the CE marking. The same applies to each valve individually.

To determine whether the joining of valves and piping constitutes an assembly to be CE-marked or not, see guidelines **3/9**, **3/10**and **3/17**.

Note 1: An item of piping can integrate a valve along its route. However, the valve is not considered as a piece of this item of piping. The same applies to any pressure accessory joined with a piping, for example a filter or a meter.

Note 2: The joining of valves and piping could then be integrated, by an assembly manufacturer or a user, with other items of pressure equipment to constitute a PED assembly or an installation submitted to national regulations (Guideline **3/2**). In this case, it may be useful that a contractual document specifies all the elements that the manufacturer of that joining will communicate to his purchaser to allow him to check the compliance to the essential safety requirements of the final assembly or installation.

Note 3: Some linguistic versions are unclear on the terminology used for the components making up an item of piping.

Accepted by WPG on: **17 Dec 2003**

Accepted by Working Group "pressure": **17 Mar 2004**

Remarks:

Guideline 2/32

[Original version as adopted on: *17 Mar 2004*]

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

Guideline related to: **Article 1 Paragraph 2.1.3** , **Annex I Section 2.3**

Question: A quick opening closure on a pressure vessel is "fitted with a device to prevent it being opened whenever the pressure or temperature of the fluid presents a hazard" in accordance with annex I section 2.3.

Is such a preventive device to be considered as a safety accessory according to the Pressure Equipment Directive (PED)?

Answer: No, according to the definition in Article 1 paragraph 2.1.3, a safety accessory is designed to protect pressure equipment against exceeding the allowable limits.

Note 1: However, there are important safety implications for these devices which are covered by the essential safety requirement 2.3 of the PED. The manufacturer shall address this as part of the hazard analysis.

Note 2: This control equipment could be of a simple self-acting type or of a more complicated type, e.g. with a pressure transmitter and an actuator.

Accepted by WPG on: **20 Jan 2004**

Accepted by Working Group "pressure": **17 Mar 2004**

Remarks:

Guideline 2/33

[Original version as adopted on: *17 Mar 2004*]

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

Guideline related to: Article 1 Paragraph 2.1.3 , Annex II

Question: When a safety accessory consists of a safety chain which itself includes "items of pressure equipment" (for example a valve or a cylinder), in which category shall this "equipment" be classified ?

Answer: When items of pressure equipment are integrated in a safety chain, they are considered as parts of the safety chain and therefore fall under the hazard analysis of the safety chain, which include the pressure containment aspect of this item.

When the hazard analysis of the safety chain shows that the failure of an individual item of pressure equipment within the chain would have no detrimental effect on the safety function to be ensured (i.e. fail-safe), the requirements of a category lower than category IV for the said "item of pressure equipment" can satisfy the requirement resulting from the hazard analysis of the safety chain.

Its integration in the safety chain is achieved by using the category IV or the category of the equipment for which the chain is specifically designed.

Note 1: This does not preclude the use of standard CE-marked items of pressure equipment as parts of a safety chain.

Note 2: A safety accessory, even when it is a safety chain, cannot be classified as an assembly.

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

Accepted by Working Group "pressure": **17 Mar 2004**

Remarks:

Guideline 2/34

[Original version as adopted on: *07 Sep 2004*]

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

Guideline related to: **Article 1 Paragraph 2.1.1** , **Article 1 Paragraph 2.5** , **Article 9 Paragraph 3**

Question: How to determine the category of a hermetically sealed refrigeration compressor ?

Answer: Hermetically sealed refrigeration compressors are pressure vessels.

Usually, a compressor is composed of two chambers : the low pressure side PS1, the volume of which is V1, and the high pressure side PS2, the volume of which is V2. The equalizing pressure during standstill is PS3 (always higher than PS1).

The category is the higher of the low pressure side (based on PS3 and V1) and of the high pressure side (based on PS2 and V2).

See guideline **1/12**.

Note 1: The highest pressure cannot occur simultaneously on both sides; during standstill there is no direct communication between the 2 chambers, due to the presence of the valves; if a valve fails, the movement of the piston cannot create pressure.

Note 2: When a compressor has more than 2 chambers (i.e. several chambers constitute the low pressure side and several chambers constitute the high pressure side) the above volumes V1 and V2 are the sums of the low pressure and the high pressure chambers respectively.

Accepted by WPG on: **15 Apr 2004**

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

Remarks:

Guideline 2/35

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

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

Guideline related to: **Article 1 Paragraph 2.1.2**

Question: Some piping is provided with a double envelope . How do these double envelopes have to be considered?

Answer: These double envelopes are to be considered as part of piping if the function of these double envelopes cannot be disassociated from the internal piping intended for the transport of the fluids..

Reason:
The technical rules for the design and the manufacture of these double envelopes are usually the same as those for piping.

Note 1:
The double envelopes of piping covered by this guideline are of two types:

- those intended to insulate products transported by the internal piping by circulation of a fluid (vapor, coolant, glycol water, etc);
- or those intended to ensure the containment of the product transported in the event of loss of tightness of the internal piping (double envelope for the transport of very toxic fluids for example.

Note 2:
This guideline does not address heat exchangers (see guideline **2/4**), or reactor loops.

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

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

Remarks:

Guideline 2/36

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

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

Guideline related to: Article 1 Paragraph 3.11

Question: Are hot blast stoves, which heat incoming cold air to a blast furnace by a regenerative process, covered by the exclusion in Article 1 paragraph 3.11?

Answer: Yes, they are excluded.

Reason :
While recuperators and hot blast stoves operate in different ways, the first heating incoming cold air by heat exchange with another hot gas and the second by the firing of an alternative heat source, they can be considered similar for the purposes of exclusion under this article. Those hot blast stoves should be included under Article 1 paragraph 3.11.

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

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

Remarks:

Guideline 2/37

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

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

Guideline related to: **Article 1 Paragraph 2.1.2** , **Article 1 Paragraph 2.1.4**

Question: How to consider, for the application of PED, a condensate trap installed on piping?

Answer: A condensate trap is intended to play an operational role which is the collection of condensates. Therefore it is generally considered as a pressure accessory, placed on the market with CE marking where appropriate.

However, a condensate trap specifically designed and manufactured as a part of a given item of piping may be assessed as part of the whole piping and, in that case, is not subject to individual CE marking.

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

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

Remarks:

Guideline 2/38

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

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

Guideline related to: **Article 1 Paragraph 3.16**

Question: What kind of silencers is covered by the exclusion of Article 1 paragraph 3.16?

Answer: This exclusion concerns only exhaust and inlet silencers that are subjected to a back-pressure lower or equal to 0,5 bar.
Generally these devices are directly in contact with atmosphere.

Silencers subjected to a back-pressure higher than 0,5 bar (for example outlet silencer of a booster) are submitted to the directive as pressure accessories.

Accepted by WPG on: **16 Dec 2004**
Accepted by Working Group "pressure": **19 Jan 2005**
Remarks: