PUBLISHED DOCUMENT

PD CR 13445-7:2002

Unfired pressure vessels —

Part 7: Guidance on the use of the conformity procedures

ICS 23.020.30

National foreword

This Published Document is the official English language version of CR 13445-7:2002.

The UK participation in its preparation was entrusted by Technical Committee PVE/1, Pressure vessels, to Subcommittee PVE/1/17, Inspection, testing and acceptance criteria, which has the responsibility to:

— aid enquirers to understand the text;

— present to the responsible international/European committee any enquiries on the interpretation, or proposals for change, and keep the UK interests informed;

— monitor related international and European developments and promulgate them in the UK.

A list of organizations represented on this subcommittee can be obtained on request to its secretary.

Cross-references

The British Standards which implement international or European publications referred to in this document may be found in the *BSI Catalogue* under the section entitled "International Standards Correspondence Index", or by using the "Search" facility of the *BSI Electronic Catalogue* or of British Standards Online.

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Unfired pressure vessels - Part 7: Guidance on the use of the conformity procedures

Récipients sous pression non soumis à la flamme - Partie 7: Guide pour l'utilisation des procédures d'évaluation de la conformité

Unbefeuerte Druckbehälter - Teil 7: Anleitung für den Gebrauch des Konformitätsbewertungsverfahrens

This CEN Report was approved by CEN on 6 March 2002. It has been drawn up by the Technical Committee CEN/TC 54.

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EUROPEAN COMMITTEE FOR STANDARDIZATION
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EUROPÄISCHES KOMITEE FÜR NORMUNG

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Contents

Foreword

This document (CR 13445-7:2002) has been prepared by Technical Committee CEN/TC 54 "Unfired pressure vessels", the secretariat of which is held by BSI.

This European Standard “Unfired pressure vessels” consists of the following Parts:

— *Part 1: General.*

— *Part 2: Materials.*

— *Part 3: Design.*

— *Part 4: Manufacture.*

— *Part 5: Testing and Inspection.*

— *Part 6 : Requirements for design and fabrication of pressure vessels and vessel parts constructed of spheroidal graphite cast iron.*

CR 13445-7*, Unfired pressure vessels - Part 7: Guidance on the use of conformity assessment procedures.*

1 Scope

This Technical Report gives guidance on the use of conformity assessment procedures for unfired pressure vessels as covered by Article 1, § 2.1.1 of the Pressure Equipment Directive (PED). The PED requires all pressure equipment falling within its scope to have its design and manufacture assessed for conformity in accordance with a series of conformity assessment procedures given in Article 10 of the PED. These procedures are described in detail in Annex III of the PED to which reference must be made in order to ensure compliance. The following summary is given for guidance purposes only.

2 Normative references

This Technical Report incorporates, by dated or undated reference, provisions from other publications. These normative references are cited at the appropriate places in the text and the publications are listed hereafter. For dated references, subsequent amendments to or revisions of any of these publications apply to this Technical Report only when incorporated in it by amendment or revision. For undated references the latest edition of the publication referred to applies (including amendments).

EN ISO 9000:2000, *Quality management systems –Fundamentals and vocabulary*.

EN ISO 9001:2000, *Quality management systems –Requirements.*

3 Terms and definitions

3.1
responsible authority
competent organisation which is independent of the manufacturer. For application within the jurisdiction of the European Union this organisation should be a notified body or a recognised third-party organisation or a user inspectorate, as appropriate according to module chosen, and designated by a Member State. For the purpose of this standard all these organisations have been collectively termed “responsible authorities”

3.2
fluid
gases, liquids and vapours in pure phase as well as mixtures thereof. A fluid may contain a suspension of solids

4 Application of the PED

4.1 General

The PED requires that for each pressure vessel the hazard category should be determined. Thereafter the manufacturer should choose the module or combination of modules of conformity assessment from those permitted recognizing that:

— each individual vessel should be manufactured to a single module or a combination of modules;

— each series of identical vessels (including batches) should be manufactured to a single module or a combination of modules.

4.2 Classification of pressure vessels in hazard categories

For the purpose of classification of pressure vessels in hazard categories, fluids (gas or liquid) are divided into two groups:

Group 1: This group comprises dangerous fluids (under Council Directive 67/548/EEC (27 June 1967), Article 2 (2)), i.e. fluids defined as:

— explosive;

— extremely flammable;

— highly flammable;

— flammable (where the maximum allowable temperature is above flashpoint);

— very toxic;

— toxic;

— oxidizing.

Group 2: This group comprises all other fluids not referred to in Group 1.

In combination with the internal volume (V) and/or the maximum allowable pressure (PS) of the vessel this leads to four specific cases:

a) Fluids in Group 1; Vessels for gases, liquefied gases, gases dissolved under pressure, vapours and also liquids whose vapour pressure at the maximum allowable temperature is greater than 0,5 bar above normal atmospheric pressure (1 013 mbar), within the following limits: $V > 1$ L and $PS \cdot V > 25$ bar·L, or, $PS > 200$ bar;

b) Fluids in Group 2; Vessels for gases, liquefied gases, gases dissolved under pressure, vapours and also liquids whose vapour pressure at the maximum allowable temperature is greater than 0,5 bar above normal atmospheric pressure (1 013 mbar), within the following limits: $V > 1$ L and $PS \cdot V > 50$ bar·L, or, $PS > 1000$ bar;

c) Fluids in Group 1; Vessels for liquids having a vapour pressure at the maximum allowable temperature of not more than 0,5 bar above normal atmospheric pressure (1 013 mbar), within the following limits: $V > 1$ L and $PS \cdot V > 200$ bar·L, or, $PS > 500$ bar;

d) Fluids in Group 2; Vessels for liquids having a vapour pressure at the maximum allowable temperature of not more than 0,5 bar above normal atmospheric pressure (1 013 mbar), within the following limits: $PS > 10$ bar and $PS \cdot V > 10\,000$ bar·L, or, $PS > 1\,000$ bar.

Pressure vessels are classified in hazard categories I to IV according to one of the relevant cases a) to d) and their volume and maximum allowable pressure. The classification has been defined in the Figures A.1 to A.4.

4.3 Conformity assessment procedures

4.3.1 General

The manufacturer should subject each vessel to a procedure to assess the conformity with the essential requirements of the PED. A list of conformity assessment procedures is given in Table B.1.

4.3.2 Choice of conformity assessment procedure

The conformity assessment procedures to be applied to a vessel with a view to affixing the CE marking should be determined by the hazard category in which the vessel is classified. The procedures that are to be applied for the various hazard categories are given in Table B.2.

The vessel manufacturer has the option of selecting between a procedure of conformity assessment involving a quality assurance system (if available) and one which does not.

The manufacturer may also choose to apply one of the procedures which apply to a higher category, if available.

4.3.3 Conformity assessment procedures and the involvement of Responsible Authorities

The manufacturer is responsible for ensuring that the requirements of EN 13445, including inspection and testing activities, are fully applied. If a CE marking is sought, it is a requirement of the PED that (in many cases) there is a supplementary involvement of a Responsible Authority (e.g. Notified Body) to ensure the requirements of the PED are met. The involvement of User Inspectorates is restricted to the modules A1, C1, F and G.

Serially produced pressure vessels manufactured to Annex A of EN 13445-5 refer to "Model Acceptance". For vessels manufactured to satisfy the PED, the requirements for model acceptance can be considered as "Type Approval" (Module B) providing the responsible authority has been involved at the appropriate time. Several conformity modules are based on the design element of a type approval.

The kind and extent of responsible authority involvement in inspection and testing activities will depend upon the conformity assessment procedure chosen by the manufacturer. For each appropriate conformity assessment procedure the participation is indicated in Table C.

Annex C has been provided in order to give guidance to the different parties so that they may be aware of the various stages where a responsible authority may be involved. Details of the inspection and testing activities are described in subsequent sub-clauses, the reference of which is given in Table C.

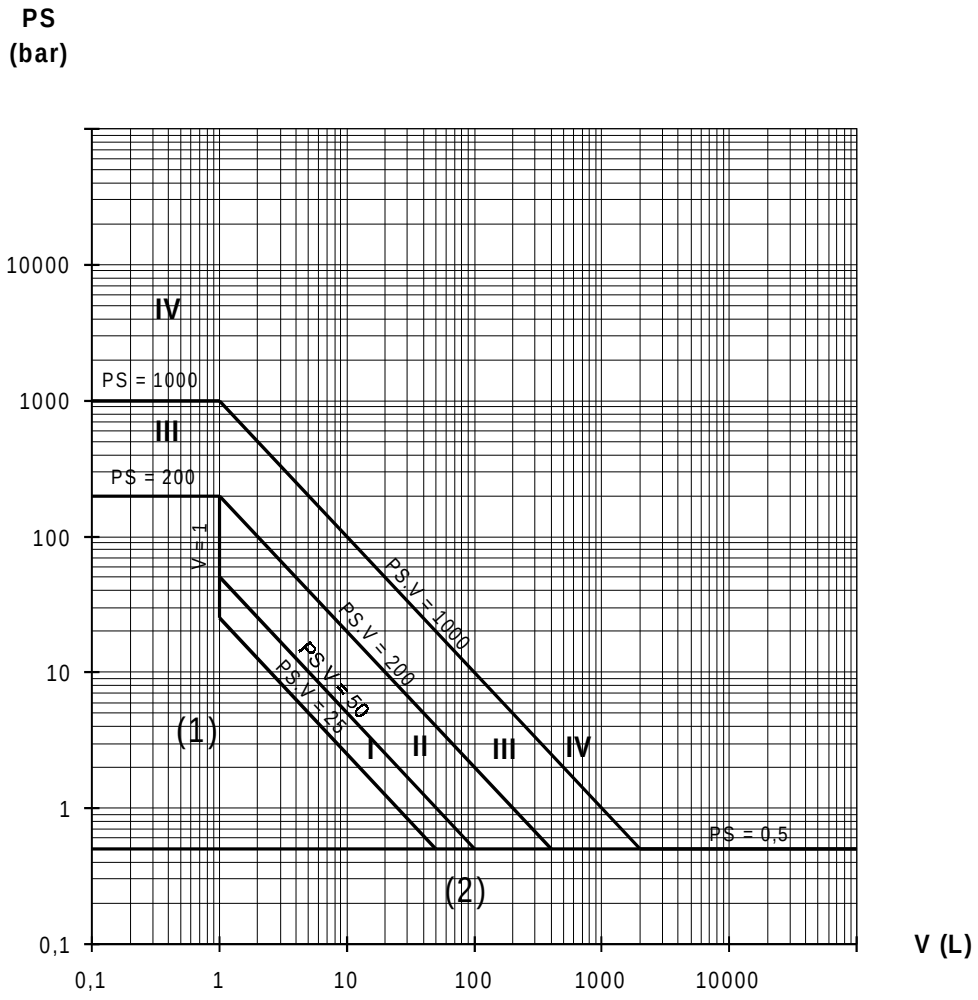
5 Subcontracting

Where the manufacturer is producing the pressure vessel under a conformity assessment procedure requiring intervention of a responsible authority, the manufacturer should inform the responsible authority of his intention to subcontract so that the responsible authority has the opportunity to take part in the subcontractor surveillance.

NOTE Where the manufacturer is producing the equipment under a conformity assessment procedure based on quality assurance, e.g. D, H, H1, the controls the manufacturer applies over subcontractors should be described in his appropriate quality system.

Annex A
(informative)

Conformity Assessment Tables



Key

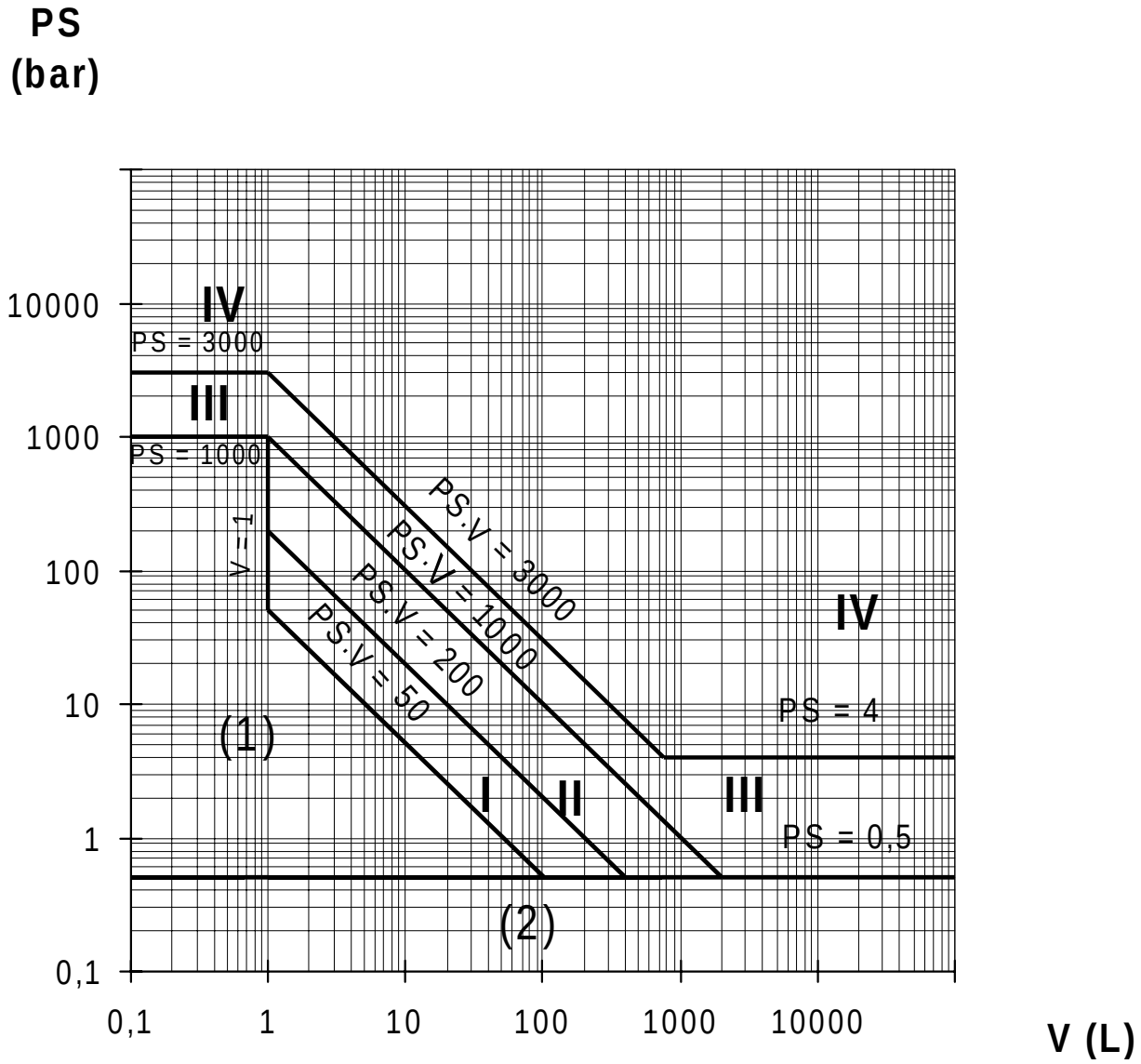
(1) Without hazard category, see article 3, paragraph 3 of Directive 97/23/EC

(2) Not in the scope of Directive 97/23/EC

NOTE 1 Exceptionally, vessels intended to contain an unstable gas and falling within categories I or II on the basis of this table should be classified in category III.

NOTE 2 Ref.: Directive 97/23/EC, Annex II, Table 1.

Figure A.1 - Vessels for fluids in accordance with 4.2 a).



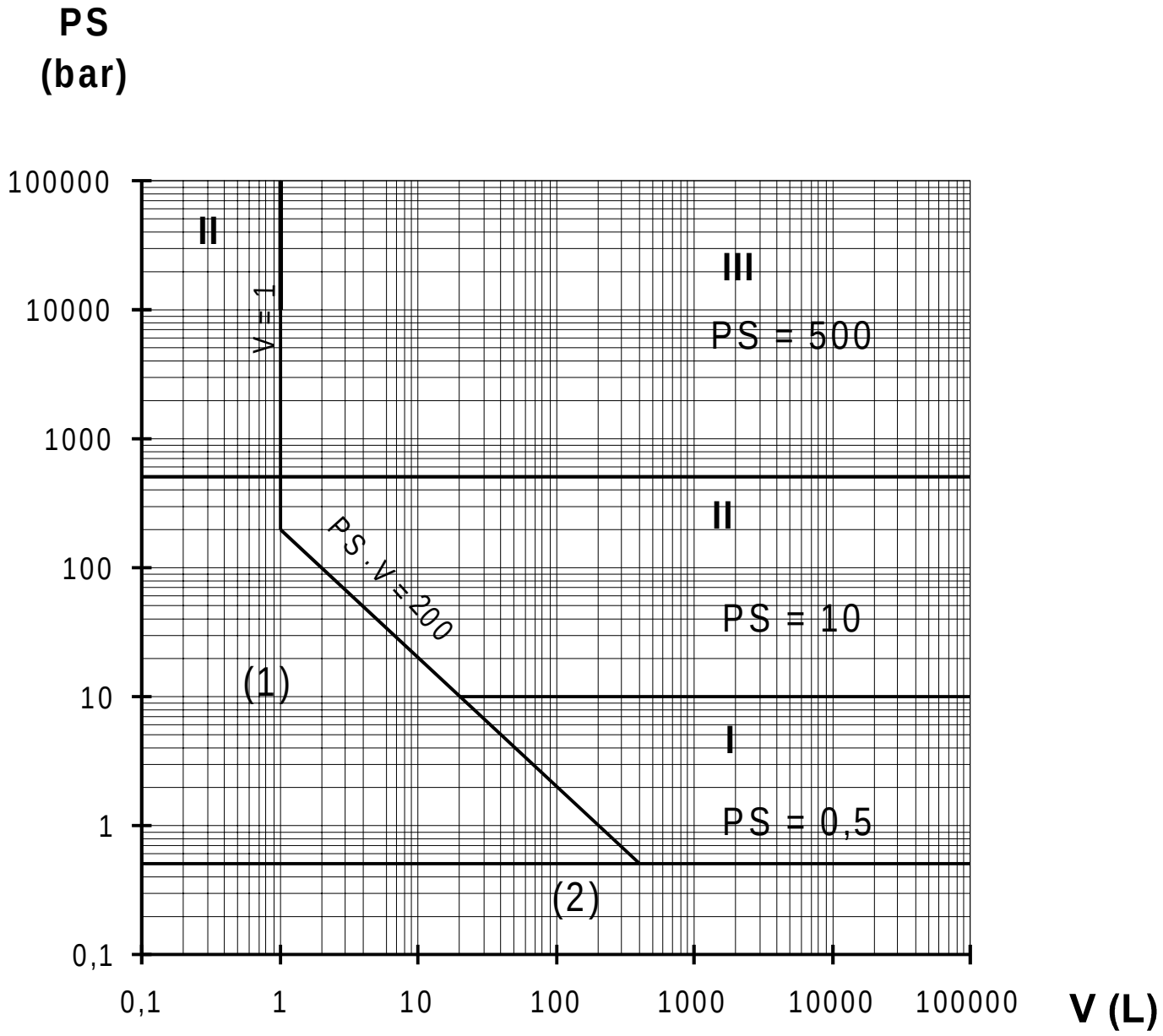
Key

(1) Without hazard category, see article 3, paragraph 3 of Directive 97/23/EC

(2) Not in the scope of Directive 97/23/EC

NOTE Ref.:Directive 97/23/EC, Annex II, Table 2.

Figure A.2 - Vessels for fluids in accordance with 4.2 b).



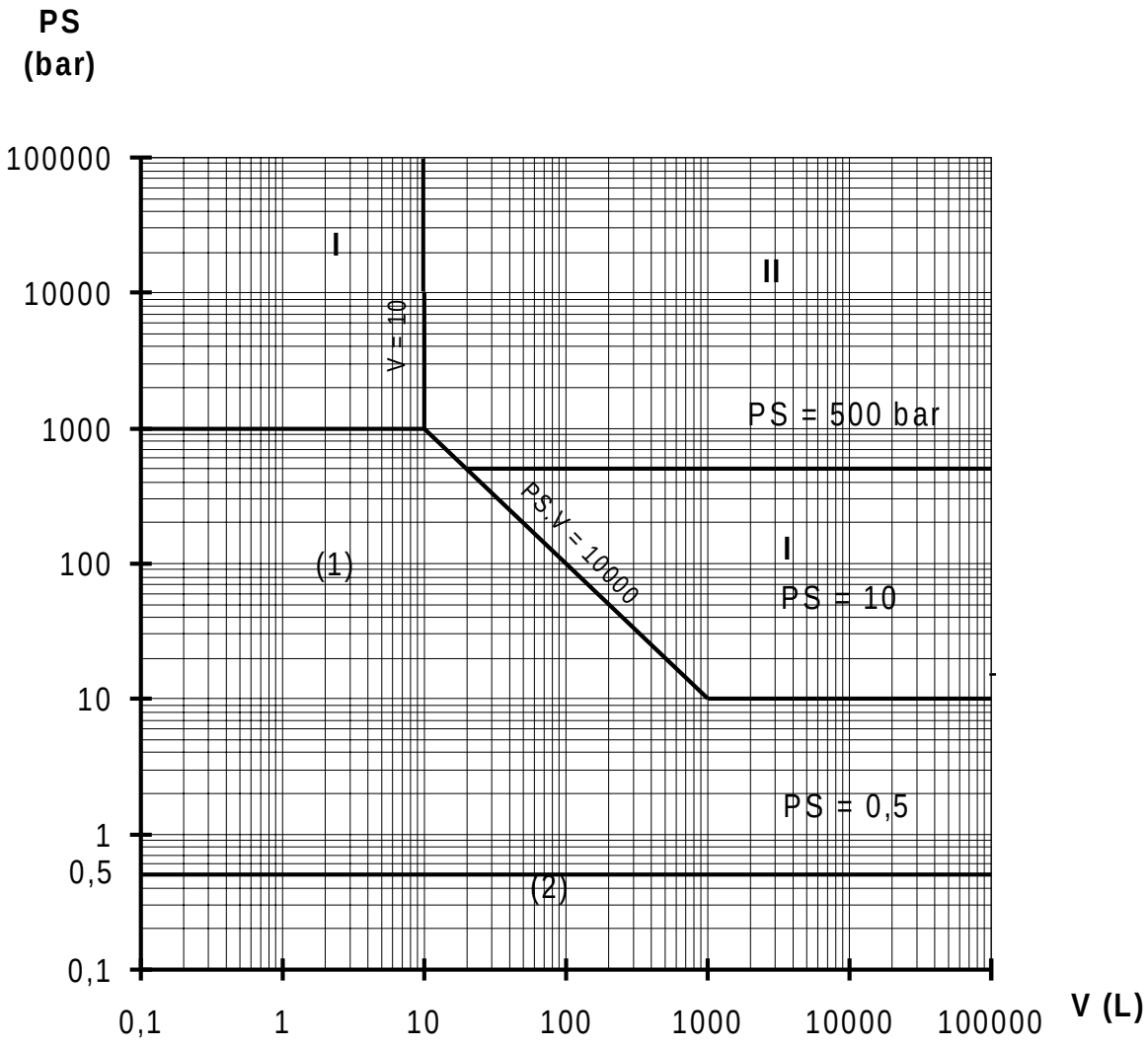
Key

(1) Without hazard category, see article 3, paragraph 3 of Directive 97/23/EC

(2) Not in the scope of Directive 97/23/EC

NOTE Ref.:Directive 97/23/EC, Annex II, Table 3.

Figure A.3 - Vessels for fluids in accordance with 4.2 c).



Key

(1) Without hazard category, see article 3, paragraph 3 of Directive 97/23/EC

(2) Not in the scope of Directive 97/23/EC

NOTE Ref.: Directive 97/23/EC, Annex II, Table 4.

Figure A.4 - Vessels for fluids in accordance with 4.2 d)

Annex B
(informative)

Conformity assessment modules

Table B.1 — Summary of conformity assessment modules

Module		Short descriptions of main features of modules [a]
A	Internal production control	Made under the manufacturer's own responsibility
A1	Internal manufacturing checks with monitoring of the final assessment	The manufacturer's own responsibility but final assessment is monitored by the Responsible Authority
B	EC type-examination	The manufacturer establishes a EC Type Examination Certificate with the Responsible Authority
B1	EC design-examination.	The manufacturer establishes a EC Design Examination Certificate with the Responsible Authority
C1	Conformity to type	Made to conform to a EC Type Examination Certificate with manufacture monitored by the Responsible Authority
D	Production quality assurance	The manufacturer uses an approved Quality System for production, final inspection and testing [c] to demonstrate conformity to either a EC Design Examination or EC Type Examination Certificate
D1	Production quality assurance	The manufacturer uses an approved Quality System for production, final inspection and testing [c] and manufactures without the use of a EC Design Examination or EC Type Examination Certificate
E	Product quality assurance	The manufacturer uses an approved Quality System for final inspection and testing [d] and conforms to a EC Type Examination Certificate
E1	Product quality assurance	The manufacturer uses an approved Quality System for final inspection and testing [d] without a EC Type Examination Certificate.
F	Product verification	Made to either a EC Type or Design Examination Certificate with examination by the Responsible Authority.
G	EC unit verification	The Responsible Authority carries out the examination
H	Full quality assurance	The manufacturer uses an approved Quality System for design, manufacture, final inspection and testing [b]
H1	Full quality assurance with design examination and special surveillance of the final assessment	The manufacturer uses an approved Quality System for design, manufacture, final inspection and testing[2)]. The Responsible Authority issues a EC Design Examination Certificate and takes part in the final assessment

[a] Warning This is only a very short, and incomplete, description. Full descriptions of the obligations arising from the provisions of the PED are given in Annex III of the Directive.
[b] e.g. in accordance with EN-ISO 9001:2000 (or the former EN-ISO 9001:1994)
[c] e.g. in accordance with EN-ISO 9001:2000 (or the former EN-ISO 9002:1994)
[d] e.g. in accordance with EN-ISO 9001:2000 (or the former EN-ISO 9003:1994)

Table B.2 — Conformity assessment procedures to be applied for the various hazard categories

HAZARD CATEGORY of the vessel:	SINGLE MODULE OR COMBINATION OF MODULES to be applied:	
	Manufacturer WITHOUT Quality System	**Manufacturer WITH Quality System**
I	**A** (*Internal production control)*	
II	**A1** (*Internal manufacturing checks with monitoring of the final assessment)*	**D1** (*Production quality assurance*) or **E1** (*Product quality assurance)*
III	**B1 + F** (*EC design examination + Product verification)* or **B + C1** (*Type examination + Conformity to type)*	**B1+ D** (*EC Design examination + Production quality assurance)* or **H** (*Full quality assurance)* or **B + E** (*EC Type examination + Product quality assurance)*
IV	**G** (*EC unit verification)* or **B + F** (*EC Type examination + Product verification)*	**H1** (*Full quality assurance with design examination and special surveillance of the final assessment)* or **B + D** (*EC Type examination + Production quality assurance)*

Annex C
(informative)

Inspection and testing activities - Summary of activities and participation of the Responsible Authority in respect of PED conformity assessment modules

Table C.1 - Quality systems

Vessel category				I	II	II	II	III	III	III	III	III	IV	IV	IV	IV
Conformity Assessment Procedure		B	B1	A	A1	D1	E1	D (+B1)	F (+B1)	E (+B)	C1 (+B)	H	D (+B)	F (+B)	G	H1
INSPECTION OPERATIONS	In accordance with EN 13445-5: 2002	Participation of the responsible authority in respect of conformity assessment modules														
Assessment [a]						RA	RA	RA		RA		RA	RA			RA
Reassessment						RA	RA	RA		RA		RA	RA			RA
Periodic audits						RA_{QS}	RA_{QS}	RA_{QS}		RA_{QS}		RA_{QS}	RA_{QS}			RA_{QS}
Unexpected visits [b]						(RA_{QS})	(RA_{QS})	(RA_{QS})		(RA_{QS})		(RA_{QS})	(RA_{QS})			RA_{QS}
Unexpected final assessment [c]								RA_{FI}		RA_{FI}		RA_{FI}	RA_{FI}			RA_{FI}
Final assessment increased surveillance [d]																RA_{FI}

RA Activities to be carried out by the Responsible Authority
RA_{QS} Activities to be monitored by the Responsible Authority during surveillance of manufacturer's quality system (periodic audits and unexpected visits)
RA_{FI} Activities to be monitored by the Responsible Authority during surveillance of manufacturer's final inspection (unexpected visits)

[a] This covers the original or initial assessment and any proposed revision.
[b] (RA_{QS}) denotes: "May be performed as described in Annex III of the PED".
[c] Unexpected final assessment according to Article 10, paragraph 1.5.
[d] Final assessment increased surveillance in form of unexpected visits as described in Annex III, H1, 2.

Table C.2 - DESIGN AND GENERAL DOCUMENTATION

Vessel category					I	II	II	II	III	III	III	III	III	IV	IV	IV	IV
Conformity Assessment Procedure			B	B1	A	A1	D1	E1	D (+B1)	F (+B1)	E (+B)	C1 (+B)	H	D (+B)	F (+B)	G	H1
DOMAIN	INSPECTION OPERATIONS	In accordance with EN 13445-5: 2002	Participation of the responsible authority in respect of conformity assessment modules														
Design data / calculations	Check that the design data/calculations conform to • technical specifications if applicable • the requirements of this European Standard	5.3.2	RA [a]	RA									RA_{QS}			RA	RA
Manufacturing drawings	Check that drawing information conform to • design data and calculations • technical specifications if applicable • the requirements of this European Standard	5.3.2	RA [a]	RA									RA_{QS}			RA	RA
Specification for subcontracted parts[c]	Check that the specification for subcontracted parts conform to: • technical specifications if applicable • manufacturing drawings • the requirements of this European Standard	7.2 and 7.3	RA [a]	RA									RA_{QS}			RA	RA
Materials assessment	Assessment of the materials to be used for suitability	5.3.2	RA [a]	RA									RA_{QS}			RA	RA
Material certificates base materials	Verification that certificate information and results conform to the design specification	5.2.6	RA [a]	RA									RA_{QS}			RA	RA
Welding consumables	Verification that the consumables to be used are in accordance with the design specification	5.2.6	RA [a]	RA									RA_{QS}			RA	RA

Table C.2 *(concluded)*

Vessel category					I	II	II	II	III	III	III	III	III	IV	IV	IV	IV
Conformity Assessment Procedure			B	B1	A	A1	D1	E1	D (+B1)	F (+B1)	E (+B)	C1 (+B)	H	D (+B)	F (+B)	G	H1
DOMAIN	INSPECTION OPERATIONS	In accordance with EN 13445-5: 2002	Participation of the responsible authority in respect of conformity assessment modules														
Welding procedure approvals	Verification that the Welding Procedure Specifications (WPS): • are appropriate for the design • are qualified according to the requirements of EN 13445-4 Approve welding procedures or check their previous approval	5.2.6, 5.2.8 and 6.4.2	RA [a]	RA									RA_{QS}			RA	RA
Personnel	Verification that the personnel undertaking the joining and NDT are qualified or approved	6.4.2 and 6.5.2.6	RA [a]	RA			RA_{QS}	RA_{QS}					RA_{QS}			RA	RA
Design review/approval[d]	Issue a written design/approval[d]	5.3.2	RA [a]	RA[b]									RA_{QS}			RA	RA [a]

RA Activities to be carried out by the Responsible Authority
RA_{QS} Activities to be monitored by the Responsible Authority during surveillance of manufacturer's quality system (periodic audits and unexpected visits)

[a] The activities identified relate to those associated with the prototype vessel representative of the type approval.

[b] The design approval is issued as an "EC Design Examination Certificate".

[c] The vessel manufacturer should ensure that those parties with responsibilities under the Conformity Assessment Procedures should be given free access to the extent they consider necessary to fulfil their duties and obligations.

[d] In all cases the manufacturer should conduct a design review. Design approval should be performed when required by the conformity assessment module. The vessel manufacturer, or his authorized representative, should submit an application for design approval to the responsible authority when required and enclose the design documentation prior to manufacture commencing.
At the time of design approval, consideration should be given to the vessel manufacturer proposals in respect of satisfying the requirements of this standard for levels of testing consistent with the hazard category, the module of conformity assessment and the testing group.
Following completion of the design approval the responsible authority should issue a certificate of design approval to the vessel manufacturer on which the vessel and design conditions along with the relevant construction drawings should be recorded. This should include identification of revision status of both calculation sheets and drawing numbers.

Table C.3 - MATERIALS

Vessel category					I	II	II	II	III	III	III	III	III	IV	IV	IV	IV
Conformity Assessment Procedure			B	B1	A	A1	D1	E1	D (+B1)	F (+B1)	E (+B)	C1 (+B)	H	D (+B)	F (+B)	G	H1
DOMAIN	INSPECTION OPERATIONS	In accordance with EN 13445-5: 2002	Participation of the responsible authority in respect of conformity assessment modules														
Material identification	Check the identification and marking of products and materials at the manufacturer's shop Identification of the material by the material certificates	6.2	RA [a]			RA_{FI}	RA_{QS}	RA_{QS}	RA_{QS}	RA	RA_{QS}	RA_{FI}	RA_{QS}	RA_{QS}	RA	RA	RA_{FI}
Transfer of identification marks	Examination of the marking transfer procedure drawn up by the manufacturer	6.2	RA [a]				RA_{QS}		RA_{QS}	RA			RA_{QS}	RA_{QS}	RA	RA	RA_{QS}
	Transfer of identification marks	6.2	RA [a]				RA_{QS}		RA_{QS}	RA			RA_{QS}	RA_{QS}	RA	RA	RA_{QS}
Acceptance of subcontracted parts	Verification that subcontracted parts conform to the manufacturer's specification		See corresponding items														

RA Activities to be carried out by the Responsible Authority
RA_{QS} Activities to be monitored by the Responsible Authority during surveillance of manufacturer's quality system (periodic audits and unexpected visits)
RA_{FI} Activities to be monitored by the Responsible Authority during surveillance of manufacturer's final inspection (unexpected visits)

[a] The activities identified relate to those associated with the prototype vessel representative of the type approval.

Table C.4 - WELDING AND FORMING

Vessel category				B	B1	I	II	II	II	III	III	III	III	III	IV	IV	IV	IV
Conformity Assessment Procedure				B	B1	A	A1	D1	E1	D (+B1)	F (+B1)	E (+B)	C1 (+B)	H	D (+B)	F (+B)	G	H1
DOMAIN	INSPECTION OPERATIONS	In accordance with EN 13445-5: 2002		Participation of the responsible authority in respect of conformity assessment modules														
Welding specifications	Verification that appropriate welding specifications are available and that their contents are compatible with the welding procedure qualifications according to the requirements of EN 13445-4	6.1 and EN 13445-4		RA [a]			RA_{FI}	RA_{QS}	RA_{QS}	RA_{QS}	RA	RA_{QS}	RA_{FI}	RA_{QS}	RA_{QS}	RA	RA	RA_{FI}
Welders and operators approval	Verification that welder and operator qualification is : • available • valid in time and valid for fabrication	6.4.2		RA [a]			RA_{FI}	RA_{QS}	RA_{QS}	RA_{QS}	RA	RA_{QS}	RA_{FI}	RA_{QS}	RA_{QS}	RA	RA	RA_{FI}
Forming procedures	Verification that the forming procedures have been qualified according to the requirements of EN 13445-4 as set out at the design stage	EN 13445-4		RA [a]			RA_{FI}	RA_{QS}	RA_{QS}	RA_{QS}	RA	RA_{QS}	RA_{FI}	RA_{QS}	RA_{QS}	RA	RA	RA_{FI}
	Verification that qualified procedures: • are available • their content is adequate • they are appropriate for the product to be formed	EN 13445-4					RA_{FI}	RA_{QS}	RA_{QS}	RA_{QS}	RA	RA_{QS}	RA_{FI}	RA_{QS}	RA_{QS}	RA	RA	RA_{QS}
Formed parts	Verify that formed parts are in accordance with the requirements of the forming procedures.	EN 13445-4		RA [a]			RA_{FI}	RA_{QS}	RA_{QS}	RA_{QS}	RA	RA_{QS}	RA_{FI}	RA_{QS}	RA_{QS}	RA	RA	RA_{FI}

RA Activities to be carried out by the Responsible Authority
RA_{QS} Activities to be monitored by the Responsible Authority during surveillance of manufacturer's quality system (periodic audits and unexpected visits)
RA_{FI} Activities to be monitored by the Responsible Authority during surveillance of manufacturer's final inspection (unexpected visits)

[a] The activities identified relate to those associated with the prototype vessel representative of the type approval.

Table C.5 - PRODUCTION TESTS

Vessel category					I	II	II	II	III	III	III	III	III	IV	IV	IV	IV
Conformity Assessment Procedure			B	B1	A	A1	D1	E1	D (+B1)	F (+B1)	E (+B)	C1 (+B)	H	D (+B)	F (+B)	G	H1
DOMAIN	INSPECTION OPERATIONS	In accordance with EN 13445-5: 2002	Participation of the responsible authority in respect of conformity assessment modules														
Production test coupons	Witness removal and marking of production test coupons	6.6.3 and EN 13445-4	RA [a]				RA_{QS}		RA_{QS}	RA			RA_{QS}	RA_{QS}	RA	RA	RA_{QS}
	Verification of any post-welding heat treatment on test coupons independent of the component complying with the specific heat treatment applied to the component	EN 13445-4	RA [a]				RA_{QS}		RA_{QS}	RA			RA_{QS}	RA_{QS}	RA	RA	RA_{QS}
	Examination of NDT reports and/or witness ultrasonic testing on production test coupons	EN 13445-4	RA [a]			RA_{FI}	RA_{QS}	RA_{QS}	RA_{QS}	RA	RA_{QS}	RA_{FI}	RA_{QS}	RA_{QS}	RA	RA	RA_{FL}
	Confirmation of identification and marking of test specimens taken from production test coupons for mechanical tests	6.6.3	RA [a]				RA_{QS}		RA_{QS}	RA			RA_{QS}	RA_{QS}	RA	RA	RA_{QS}
	Witness mechanical tests	6.6.3	RA [a]				RA_{QS}		RA_{QS}	RA			RA_{QS}	RA_{QS}	RA	RA	RA_{QS}
	Verification that the test information and results contained in the manufacturer's report conform to the requirements of this European Standard	6.6.4	RA [a]			RA_{FI}	RA_{QS}	RA_{QS}	RA_{QS}	RA	RA_{QS}	RA_{FI}	RA_{QS}	RA_{QS}	RA	RA	RA_{FL}

RA Activities to be carried out by the Responsible Authority
RA_{QS} Activities to be monitored by the Responsible Authority during surveillance of manufacturer's quality system (periodic audits and unexpected visits)
RA_{FI} Activities to be monitored by the Responsible Authority during surveillance of manufacturer's final inspection (unexpected visits)

[a] The activities identified relate to those associated with the prototype vessel representative of the type approval.

Table C.6 - INTERSTAGE FABRICATION

Vessel category					I	II	II	II	III	III	III	III	III	IV	IV	IV	IV
Conformity Assessment Procedure			B	B1	A	A1	D1	E1	D (+B1)	F (+B1)	E (+B)	C1 (+B)	H	D (+B)	F (+B)	G	H1
DOMAIN	INSPECTION OPERATIONS	In accordance with EN 13445-5: 2002	Participation of the responsible authority in respect of conformity assessment modules														
Interstage testing	Examination of material cut edges and heat affected zones	6.3.2	RA [a]				RA_{QS}		RA_{QS}	RA			RA_{QS}	RA_{QS}	RA	RA	RA_{QS}
	Examination of set up of seams for welding including dimensional check, weld preparations, tack welds, etc.	6.4.1	RA [a]				RA_{QS}		RA_{QS}	RA			RA_{QS}	RA_{QS}	RA	RA	RA_{QS}
	Examination second side of weld preparations after first side is completed and root cleaned	6.4.1	RA [a]				RA_{QS}		RA_{QS}	RA			RA_{QS}	RA_{QS}	RA	RA	RA_{QS}
	Visual inspection of completed welds for penetration, fusion or profile defects, prior to any post-welding heat treatments	6.5.2	RA [a]				RA_{QS}		RA_{QS}	RA			RA_{QS}	RA_{QS}	RA	RA	RA_{QS}

RA Activities to be carried out by the Responsible Authority

RA_{QS} Activities to be monitored by the Responsible Authority during surveillance of manufacturer's quality system (periodic audits and unexpected visits)

[a] The activities identified relate to those associated with the prototype vessel representative of the type approval.

Table C.7 - POST-WELD HEAT TREATMENT

Vessel category					I	II	II	II	III	III	III	III	III	IV	IV	IV	IV
Conformity Assessment Procedure			B	B1	A	A1	D1	E1	D (+B1)	F (+B1)	E (+B)	C1 (+B)	H	D (+B)	F (+B)	G	H1
DOMAIN	INSPECTION OPERATIONS	In accordance with EN 13445-5: 2002	Participation of the responsible authority in respect of conformity assessment modules														
Post weld heat treatment	Verification that the post-weld heat treatment procedures comply with the requirements of this European Standard	6.7	RA [a]				RA_{QS}		RA_{QS}	RA			RA_{QS}	RA_{QS}	RA	RA	RA_{QS}
	Verification that time/temperature recordings or other documentary records conform to the requirements of this European Standard	6.7	RA [a]			RA_{FI}	RA_{QS}	RA_{QS}	RA_{QS}	RA	RA_{QS}	RA_{FI}	RA_{QS}	RA_{QS}	RA	RA	RA_{FI}

RA Activities to be carried out by the Responsible Authority
RA_{QS} Activities to be monitored by the Responsible Authority during surveillance of manufacturer's quality system (periodic audits and unexpected visits)
RA_{FI} Activities to be monitored by the Responsible Authority during surveillance of manufacturer's final inspection (unexpected visits)

[a] The activities identified relate to those associated with the prototype vessel representative of the type approval.

Table C.8 - NON DESTRUCTIVE TESTING

Vessel category					I	II	II	II	III	III	III	III	III	IV	IV	IV	IV
Conformity Assessment Procedure			B	B1	A	A1	D1	E1	D (+B1)	F (+B1)	E (+B)	C1 (+B)	H	D (+B)	F (+B)	G	H1
DOMAIN	INSPECTION OPERATIONS	In accordance with EN 13445-5: 2002	Participation of the responsible authority in respect of conformity assessment modules														
Non destructive testing procedures	Verification of • appropriate NDT procedures are available • the procedures meet the requirements of this standard	6.5.6	RA [a]			RA_{FI}	RA_{QS}	RA_{QS}	RA_{QS}	RA	RA_{QS}	RA_{FI}	RA_{QS}	RA_{QS}	RA	RA	RA_{FI}
Qualification of NDT personnel	Verification of the validity of the qualification of NDT operators	6.5.2.6	RA [a]			RA_{FI}	RA_{QS}	RA_{QS}	RA_{QS}	RA	RA_{QS}	RA_{FI}	RA_{QS}	RA_{QS}	RA	RA	RA_{FI}
Non destructive testing	Scrutinise any radiographs and check conformance to the RT-test reports and acceptance criteria	6.5.3	RA [a]				RA_{QS}		RA_{QS}	RA			RA_{QS}	RA_{QS}	RA	RA	RA_{QS}
	Witness non destructive testing other than radiographic testing, as defined at the design stage	6.5.5 and 6.5.6	RA [a]				RA_{QS}		RA_{QS}	RA			RA_{QS}	RA_{QS}	RA	RA	RA_{QS}
NDT reports	Verification of the information and results conforming to the acceptance criteria of NDT reports	6.5.6	RA [a]			RA_{FI}	RA_{QS}	RA_{QS}	RA_{QS}	RA	RA_{QS}	RA_{FI}	RA_{QS}	RA_{QS}	RA	RA	RA_{FI}

RA Activities to be carried out by the Responsible Authority
RA_{QS} Activities to be monitored by the Responsible Authority during surveillance of manufacturer's quality system (periodic audits and unexpected visits)
RA_{FI} Activities to be monitored by the Responsible Authority during surveillance of manufacturer's final inspection (unexpected visits)

[a] The activities identified relate to those associated with the prototype vessel representative of the type approval.

Table C.9 - FINAL TESTING, MARKING AND DOCUMENTATION

Vessel Category					I	II	II	II	III	III	III	III	III	IV	IV	IV	IV
Conformity Assessment Procedure			B	B1	A	A1	D1	E1	D (+B1)	F (+B1)	E (+B)	C1 (+B)	H	D (+B)	F (+B)	G	H1
DOMAIN	INSPECTION OPERATIONS	In accordance with EN 13445-5: 2002	Participation of the responsible authority in respect of conformity assessment modules														
Pre-proof test inspection	Dimensional checking, visual inspection and identification of all accessible parts after vessel completion, prior to proof test and the application of any covering	10.2.1	RA [a]			RA_{FI}	RA_{QS}	RA_{QS}	RA_{QS}	RA	RA_{QS}	RA_{FI}	RA_{QS}	RA_{QS}	RA	RA	RA_{FI}
Proof test	• Verification of the availability of test instructions • Witness final proof test	10.2.3	RA [a]			RA_{FI}	RA_{QS}	RA_{QS}	RA_{QS}	RA	RA_{QS}	RA_{FI}	RA_{QS}	RA_{QS}	RA	RA	RA_{FI}
Post-proof test inspection	• Examination of the calibration reports for the measurement apparatus used in pressure tests, dimensional and other acceptance examinations or tests • Carrying out of visual inspection after proof testing	10.2.3.11 10.2.4	RA [a]			RA_{FI}	RA_{QS}	RA_{QS}	RA_{QS}	RA	RA_{QS}	RA_{FI}	RA_{QS}	RA_{QS}	RA	RA	RA_{FI}
	Check marking on nameplate to show compliance with EN 13445	11	RA [a]			RA_{FI}	RA_{QS}	RA_{QS}	RA_{QS}	RA	RA_{QS}	RA_{FI}	RA_{QS}	RA_{QS}	RA	RA	RA_{FI}
Safety devices	Check provision of safety devices	10.2.5	RA [a]			RA_{FI}	RA_{QS}	RA_{QS}	RA_{QS}	RA	RA_{QS}	RA_{FI}	RA_{QS}	RA_{QS}	RA	RA	RA_{FI}
Manufacturer's data dossier	Verification of compliance with the Design and Manufacturing Schedule Review for completeness	10.1 12	RA [a]			RA_{FI}	RA_{QS}	RA_{QS}	RA_{QS}	RA	RA_{QS}	RA_{FI}	RA_{QS}	RA_{QS}	RA	RA	RA_{FI}

Table C.9 *(concluded)*

Vessel Category					**I**	**II**	**II**	**II**	**III**	**III**	**III**	**III**	**III**	**IV**	**IV**	**IV**	**IV**
Conformity Assessment Procedure			B	B1	A	A1	D1	E1	D (+B1)	F (+B1)	E (+B)	C1 (+B)	H	D (+B)	F (+B)	G	H1
DOMAIN	INSPECTION OPERATIONS	In accordance with EN 13445-5: 2002	Participation of the responsible authority in respect of conformity assessment modules														
Notified Body identification number	Affix or cause to be affixed					RA	RA	RA	RA	RA	RA	RA	RA	RA	RA	RA	RA
Type approval	EC Type approval certificate		RA														
Conformity assessment	Declaration of conformity with PED[b]									RA					RA	RA	
	Verify the Certificate of compliance with this European Standard	11.5	RA							RA					RA	RA	

RA Activities to be carried out by the Responsible Authority

RA_{QS} Activities to be monitored by the Responsible Authority during surveillance of manufacturer's quality system (periodic audits and unexpected visits)

RA_{FI} Activities to be monitored by the Responsible Authority during surveillance of manufacturer's final inspection (unexpected visits)

[a] The activities identified relate to those associated with the prototype vessel representative of the type approval.

[b] For the tests carried out.

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