BRITISH STANDARD

BS EN
10207:2005

Steels for simple pressure vessels — Technical delivery requirements for plates, strips and bars

The European Standard EN 10207:2005 has the status of a British Standard

ICS 77.140.30

BSI
British Standards

National foreword

This British Standard is the official English language version of EN 10207:2005. It supersedes BS EN 10207:1992 which is withdrawn.

The UK participation in its preparation was entrusted by Technical Committee ISE/73, Steel for pressure purposes, to Subcommittee ISE/73/2, Steel plates and bars for pressure purposes, which has the responsibility to:

— aid enquirers to understand the text;

— present to the responsible 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.

This publication does not purport to include all the necessary provisions of a contract. Users are responsible for its correct application.

Compliance with a British Standard does not of itself confer immunity from legal obligations.

Summary of pages

This document comprises a front cover, an inside front cover, the EN title page, pages 2 to 18, an inside back cover and a back cover.

The BSI copyright notice displayed in this document indicates when the document was last issued.

Amendments issued since publication

Amd. No.	Date	Comments

This British Standard was published under the authority of the Standards Policy and Strategy Committee on 3 May 2005

ISBN 0 580 46007 X

EUROPEAN STANDARD

NORME EUROPÉENNE

EUROPÄISCHE NORM

EN 10207

April 2005

ICS 77.140.30

Supersedes EN 10207:1991

English version

Steels for simple pressure vessels - Technical delivery requirements for plates, strips and bars

Aciers pour appareils à pression simples - Conditions techniques de livraison des tôles, bandes et barres

Stähle für einfache Druckbehälter - Technische Lieferbedingungen für Blech, Band und Stabstahl

This European Standard was approved by CEN on 21 February 2005.

CEN members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this European Standard the status of a national standard without any alteration. Up-to-date lists and bibliographical references concerning such national standards may be obtained on application to the Central Secretariat or to any CEN member.

This European Standard exists in three official versions (English, French, German). A version in any other language made by translation under the responsibility of a CEN member into its own language and notified to the Central Secretariat has the same status as the official versions.

CEN members are the national standards bodies of Austria, Belgium, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Slovakia, Slovenia, Spain, Sweden, Switzerland and United Kingdom.

EUROPEAN COMMITTEE FOR STANDARDIZATION
COMITÉ EUROPÉEN DE NORMALISATION
EUROPÄISCHES KOMITEE FÜR NORMUNG

Management Centre: rue de Stassart, 36 B-1050 Brussels

Ref. No. EN 10207:2005: E

Contents

Foreword

This document (EN 10207:2005) has been prepared by Technical Committee ECISS/TC 22 “Steels for pressure purposes – Qualities”, the secretariat of which is held by DIN.

This European Standard shall be given the status of a national standard, either by publication of an identical text or by endorsement, at the latest by October 2005, and conflicting national standards shall be withdrawn at the latest by October 2005.

This document supersedes EN 10207:1991.

This document has been prepared under a mandate given to CEN by the European Commission and the European Free Trade Association, and supports essential requirements of EU Directive 87/404/EEC.

For relationship with EU Directive 87/404/EEC, see informative annex ZA, which is an integral part of this document.

NOTE The clauses marked with two dots (●●) contain information relating to agreements which may be made at the time of enquiry and order.

According to the CEN/CENELEC Internal Regulations, the national standards organizations of the following countries are bound to implement this European Standard: Austria, Belgium, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Slovakia, Slovenia, Spain, Sweden, Switzerland and United Kingdom.

1 Scope

This document specifies the technical delivery requirements for flat products and bars made of steel in accordance with the specifications for pressurized parts in simple pressure vessels as defined in the Directive 87/404/EEC (see Annex A) and standardized in EN 286-1 to -3.

2 Normative references

The following referenced documents are indispensable for the application of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

EN 10002-1, *Metallic materials — Tensile testing — Part 1: Method of testing at ambient temperature.*

EN 10002-5, *Metallic materials — Tensile testing — Part 5: Method of testing at elevated temperatures.*

EN 10020:2000, *Definition and classification of grades of steel.*

EN 10021:1993, *General technical delivery requirements for steel and iron products.*

prEN 10027-1, *Designation systems for steel — Part 1: Steel names.*

EN 10027-2, *Designation systems for steels — Part 2: Numerical system.*

EN 10029, *Hot rolled steel plates 3 mm thick or above — Tolerances on dimensions, shape and mass.*

EN 10045-1, *Metallic materials — Charpy impact test — Part 1: Test method.*

EN 10048, *Hot rolled narrow steel strip — Tolerances on dimensions and shape.*

EN 10051, *Continuously hot rolled uncoated plate, sheet and strip of non–alloy and alloy steels — Tolerances on dimensions and shape.*

EN 10052:1993, *Vocabulary of heat treatment terms for ferrous products.*

EN 10058, *Hot rolled flat steel bars for general purposes — Dimensions and tolerances on shape and dimensions.*

EN 10059, *Hot rolled square steel bars for general purposes — Dimensions and tolerances on shape and dimensions.*

EN 10060, *Hot rolled round steel bars for general purposes — Dimensions and tolerances on shape and dimensions.*

EN 10061, *Hot rolled hexagon steel bars for general purposes — Dimensions and tolerances on shape and dimensions.*

EN 10079:1992, *Definition of steel products.*

EN 10160, *Ultrasonic testing of steel flat products of thickness equal or greater than 6 mm (reflection method)*.

EN 10163-2, Delivery requirements for surface condition of hot rolled steel plates, wide flats and sections – Part 2: Plate and wide flats.

EN 10168, *Steel products — Inspection documents — List of information and description.*

EN 10204:2004, *Metallic products — Types of inspection documents.*

EN 10221, *Surface quality classes for hot-rolled bars and rods — Technical delivery conditions.*

EN ISO 377, *Steel and steel products — Location and preparation of samples and test pieces for mechanical testing (ISO 377:1997).*

EN ISO 2566-1, *Steel — Conversion of elongation values — Part 1: Carbon and low alloy steels (ISO 2566-1:1994).*

EN ISO 14284, *Steel and iron — Sampling and preparation of samples for the determination of chemical composition (ISO 14284:1996).*

CR 10261, *ECISS Information Circular 11 — Iron and steel — Review of available methods of chemical analysis.*

3 Terms and definitions

For the purposes of this document, the following terms and definitions apply in addition to or deviating from the terms and definitions in EN 10020:2000, EN 10021:1993, EN 10052:1993, EN 10079:1992 and EN 10204:2004.

3.1
normalizing rolling
rolling process in which final deformation is carried out in a certain temperature range leading to a material condition equivalent to that obtained after normalizing so that the specified values of the mechanical properties are retained even after normalizing

NOTE The symbol for this delivery condition and for the normalized condition is N.

3.2
simple pressure vessel
see Annex A

4 Classification and designation

4.1 Classification

In accordance with the classification system in EN 10020, the steel grades P235S and P265S are non-alloy quality steels and the steel grade P275SL is a non-alloy special steel.

4.2 Designation

The steel grades are designated with steel names and steel numbers. The steel names are allocated in accordance with prEN 10027-1. The steel numbers are allocated in accordance with EN 10027-2.

5 Information to be supplied by the purchaser

5.1 Mandatory information

The following information shall be supplied by the purchaser at the time of enquiry and order:

a) quantity (mass or total length or number);

b) product form (plate/sheet or strip or bar);

c) surface class for bars (see 7.4.2);

d) European Standard or document specifying the tolerances on dimensions, shape and mass and, if the relevant European Standard or document permits the purchaser certain options, e.g. regarding finishes or tolerance grades, specific information on these aspects (see 7.6);

e) specified dimensions of the product to be delivered (see 7.6);

f) number of this document;

g) designation of the steel grade (steel name or steel number);

5.2 Options

A number of options are specified in this document and listed below. In the event that the purchaser does not indicate a wish to implement any of these options at the time of enquiry and order, the products shall be supplied in accordance with the basic specification (see 5.1).

a. steelmaking process (see 6.1.1);

b. internal soundness (see 7.5);

c. specific inspection (see 8.1.2);

d. additional tests (see 8.3.2);

e. circular test pieces for the tensile test (see Table 5, footnote b);

f. test temperature for tensile test at elevated temperature (see 10.4).

6 Manufacturing process

6.1 Steelmaking

6.1.1 ●● Unless a special steelmaking process has been agreed at the time of enquiry and order, the steelmaking process for steels in accordance with this document shall be at the discretion of the manufacturer.

6.1.2 The steels shall be non-rimming and not susceptible to ageing.

NOTE For these steels covered in Table 1 requirements of the Directive 87/404/EEC were taken into account by the specification of a minimum total aluminium content of 0,020 %.

6.2 Delivery condition

The products shall be delivered in the normalized or in an equivalent condition obtained by normalizing rolling (see 3.1).

7 Requirements

7.1 General

The products shall conform to the requirements of this document.

In addition, the general technical delivery requirements specified in EN 10021 apply.

7.2 Chemical composition

7.2.1 The chemical composition determined from the cast analysis in accordance with 10.1 shall comply with the requirements in Table 1.

7.2.2 The product analysis may deviate from the specified limits for the cast analysis by the values given in Table 2.

Table 1 — Chemical composition (cast analysis) in % by mass

Steel grade		C max.	Si max.	Mn	P max.	S max.	Al_{tot} min.[a]
Steel name	Steel number						
P235S	1.0112	0,16	0,35	0,40 to 1,20	0,025	0,025	0,020
P265S	1.0130	0,20	0,40	0,50 to 1,50	0,025	0,025	0,020
P275SL	1.1100	0,16	0,40	0,50 to 1,50	0,025	0,020	0,020

[a] If sufficient other nitrogen binding elements are present, the minimum total aluminium content does not apply. If such nitrogen binding elements were added to the steel their content shall be given in the inspection document.

Table 2 — Permissible deviations in the result of the product analysis from the values specified in Table 1 for the cast analysis

Element	Specified values for the cast analysis according to Table 1 % by mass	Permissible deviation[a] of the product analysis from the values listed in Table 1 for the cast analysis % by mass
C	≤ 0,20	+ 0,02
Si	≤ 0,40	+ 0,05
Mn	≤ 1,00	± 0,05
	> 1,00 to ≤ 1,50	± 0,10
P	≤ 0,025	+ 0,005
S	≤ 0,025	+ 0,005
Al	≥ 0,020	- 0,005

[a] If several product analyses are carried out for one cast and if, in this case, values for an individual element are established which fall outside the permitted range for the chemical composition, then it is only permissible that the values either exceed the permissible maximum value or fall short of the permissible minimum value, but not both for one cast.

7.3 Mechanical properties

The requirements in Tables 3 and 4 apply for test pieces taken, prepared and tested in accordance with clause 9 and 10.2 to 10.4. The values relate to the specified thickness (thickness at ordering) of the products and apply to the delivery conditions specified in 6.2.

Table 3 — Mechanical properties

Steel grade		Minimum yield strength $R_{e,min.}$ for specified thickness t in mm			Tensile strength R_m	Minimum elongation $A_{long.,min.}$ [a,b]				Minimum impact energy $KV_{long.,min}$ [c]	
						L_0 = 80 mm	$L_0 = 5{,}65\sqrt{S_0}$				
						for specified thickness t in mm					
Steel-name	Steel-number	≤ 16	16 < t ≤ 40	40 < t ≤ 60		2 < t ≤ 2,5	2,5 < t < 3	3 ≤ t < 40	40 < t ≤ 60		
		MPa	MPa	MPa	MPa	%	%	%	%	at °C	J
P235S	1.0112	235	225	215	360 to 480	20	21	26	25	– 20	28
P265S	1.0130	265	255	245	410 to 530	17	18	22	22	– 20	28
P275SL	1.1100	275	265	255	390 to 510	19	20	24	24	– 50	28

a Minimum elongation after fracture for longitudinal tensile test pieces (see Table 5, footnote a).

b If for flat products in rolled width of ≥ 600 mm in accordance with Table 5 transverse tensile test pieces are tested the minimum values for elongation at fracture are by 2 units lower than the minimum values specified above for longitudinal test pieces.

c Minimum impact energy for longitudinal Charpy-V-notch impact test pieces (see 10.3).

Table 4 — Minimum 0,2 % proof strength $R_{p0,2}$ at elevated temperatures

Steel grade		Product thickness t	$R_{p0,2}$ in MPa at a temperature in °C of				
Steel-name	Steel-number	mm	100	150	200	250	300
P235S	1.0112	≤ 60	171	162	153	135	117
P265S	1.0130	≤ 60	194	185	176	158	140
P275SL	1.1100	≤ 40	221	203	176	159	132
		40 < t ≤ 60	212	194			

7.4 Surface condition

7.4.1 For plates, the requirements for surface quality class B2 of EN 10163-2 apply.

7.4.2 For bars, a surface class in accordance with EN 10221 shall be agreed at the time of enquiry and order.

7.5 ●● Internal soundness

The products shall be free from defects that preclude their intended use.

7.6 For plates in thickness equal or greater than 6 mm, special agreements referring to tests on internal soundness may be made on the basis of EN 10160 at the time of enquiry and order. Dimensions and tolerances on dimensions

The dimensions and tolerances on dimensions for the products to be delivered shall be specified to the following dimensional standards:

a) in case of hot rolled steel plates 3 mm thick or above with reference to 10029, thickness tolerance class B.

b) in the case of

— continuously hot rolled wide strip (rolled width ≥ 600 mm),

— or hot rolled slit strip in width < 600 mm made of wide strip,

— or hot rolled sheet in thicknesses under 3 mm

with reference to EN 10051.

c) in the case of hot rolled narrow strip (rolled width < 600 mm) with reference to EN 10048.

d) in the case of bars with

— rectangular section with reference to EN 10058;

— square section with reference to EN 10059;

— round section with reference to EN 10060;

— hexagon section with reference to EN 10061.

7.7 Calculation of mass

A density of 7,85 kg/dm^3 shall be used as the basis for the calculation of the nominal mass from the specified dimensions of the steels specified in Table 1.

8 Inspection

8.1 Types of inspection

8.1.1 The products in accordance with this document shall be checked by non-specific inspection.

8.1.2 ●● By agreement at the time of enquiry and order, specific inspection may be specified.

8.2 Inspection documents

8.2.1 Type of Inspection documents

8.2.1.1 Unless otherwise specified (see 8.1.2), a test report 2.2 in accordance with EN 10204 shall be issued.

8.2.1.2 In the case of specific inspection (see 8.1.2) an inspection certificate 3.1 in accordance with EN 10204 shall be issued.

8.2.2 Content of inspection documents

8.2.2.1 The content of the inspection documents shall be in accordance with EN 10168.

8.2.2.2 The test report 2.2 shall contain the following codes and information:

A – commercial transaction and parties involved;

B – description of products to which the inspection document applies;

C01 to C03 – location and direction of test pieces and testing temperature;

C10 to C13 – tensile test (results for one test);

C40 to C43 – impact test if applicable (results for one test);

C71 to C92 – chemical composition (results of the cast analysis);

Z – validation.

8.2.2.3 The inspection certificate 3.1 shall contain the following codes and information:

A – commercial transaction and parties involved;

B – description of products to which the inspection document applies;

C00 – identification of the product where necessary;

C01 to C03 – location and direction of test pieces and testing temperature;

C10 to C13 – tensile test (results for one specific test);

C40 to C43 – impact test if applicable (results for one specific test);

C71 to C92 – chemical composition (results of the cast analysis and if applicable, of the product analysis);

D – results of the visual inspection and, if applicable, of the ultrasonic test;

Z – validation.

8.3 Tests to be carried out for specific inspection

8.3.1 The following tests shall be carried out:

— tensile test at room temperature (see 10.2);

— impact test (see 9.3.2 and 10.3);

— visual examination of the surface condition on each product (see 10.5);

8.3.2 ●●The following tests may be agreed at the time of enquiry and order:

— product analysis (see 10.1);

— tensile test for verification of $R_{p0,2}$ at elevated temperatures (see 10.4):

— ultrasonic test for verification of internal soundness on each plate (see 10.6).

9 Sampling and preparation of samples and test pieces

9.1 Test units

9.1.1 For the product analysis, the test unit shall be the cast.

9.1.2 The test unit for the tensile test at room temperature and the impact test shall comprise products of the same cast, the same production process, the same product form and the same thickness range as specified in Table 3 for the yield strength in masses of 40 t or parts thereof.

9.1.3 The test unit for the tensile test at elevated temperature shall be the cast.

9.2 Preparation of samples and test pieces

9.2.1 Sampling for the product analysis

The samples shall be taken in accordance with EN ISO 14284.

9.2.2 Test pieces for the mechanical tests

9.2.2.1 General

The samples and test pieces shall be selected and prepared in accordance with EN ISO 377.

9.2.2.2 Samples and test pieces taken from flat products

The sample shall be taken so that the distance of the test pieces from the edge of the long side of the product correspond approximately to the following:

— $w/4$: in the case of products with a rolled width $w \geq 600$ mm;

— $w/3$: in the case of products with a rolled width $w < 600$ mm.

NOTE Verification of the mechanical properties is normally carried out before slitting. In the unusual cases where their verification is required after slitting, suitable measures should as far as possible be taken to find out the location of test pieces specified above.

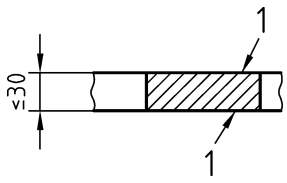
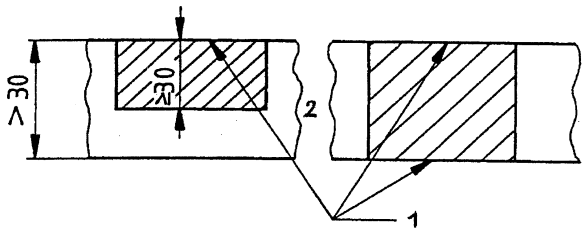
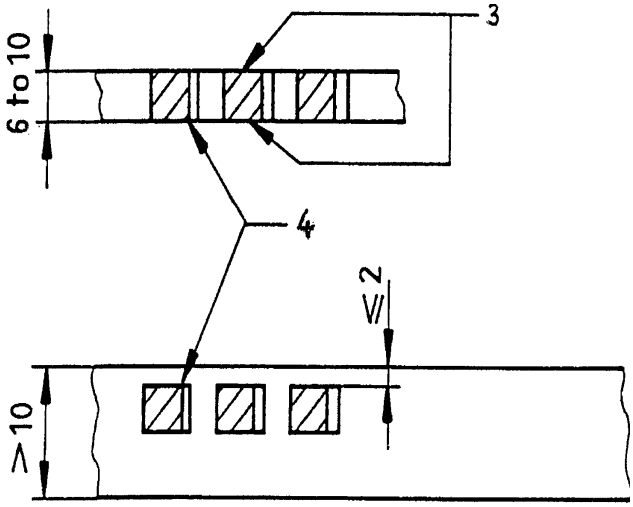
The test pieces shall be taken at a sufficient distance from the end of the product.

For the distance of the test pieces from hot rolled surface and the orientation of the test pieces axis, the indications in Table 5 apply.

9.2.2.3 Samples and test pieces taken from bars

For bars, longitudinal test pieces shall be taken in accordance with Table 6.

Table 5 — Test piece locations for flat products (see also 9.2.2.2)

Type of test	Product thickness t mm	Orientation of the test pieces for rolled width of		Distance of the test pieces from the rolled surface mm
		< 600 mm	≥ 600 mm	
Tensile [a,b]	≤ 30	longitudinal	transverse	
	> 30			
Impact [c]	6 ≤ t ≤ 10	longitudinal	longitudinal	
	> 10			

Key

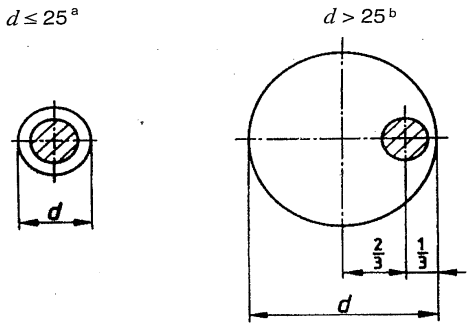
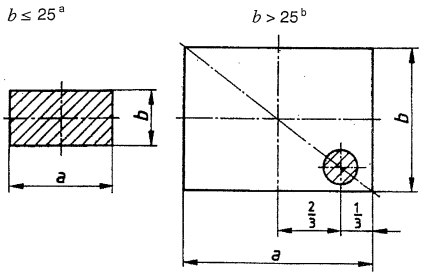
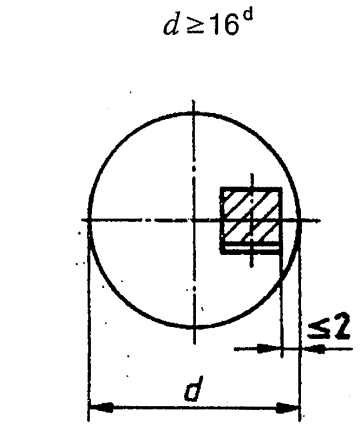
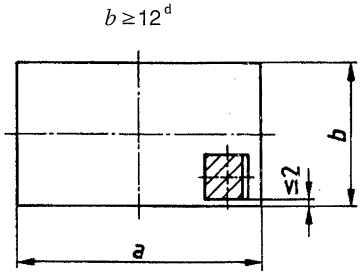
1 rolled surface 2 alternative sampling 3 unmachined or machined (to ≥ 5 mm; see 9.3.2) 4 notch direction

[a] In case of doubt or dispute, for product thickness ≥ 3 mm proportional test pieces of gauge length L_0 = 5,65 $\sqrt{S_0}$ shall be used. For normal testing, for reasons of economy, test pieces of a constant measuring length may be used provided the result obtained for elongation after breaking is converted in accordance with EN ISO 2566-1.

[b] ●● For products of thickness > 30 mm a circular test piece may be used if agreed at the time of enquiry and order.

[c] The axis of the notch shall be perpendicular to the surface of the product.

Table 6 — Test piece location in bars

Type of test	Products with round cross section	Products with rectangular cross section
Tensile		
Impact [c]		

a For products with small dimensions (d or b ≤ 25 mm) the test piece, if possible, consists of an unmachined full section of the product.

b For products of diameter or thickness ≤ 40 mm the manufacturer may either apply
– the rules specified for products of diameter or thickness ≤ 25 mm, or
– take the test piece at a location nearer the centre than indicated in the figure.

c For products of round cross section, the axis of the notch is approximately a diagonal; for products with rectangular cross section, the axis of the notch is perpendicular to the greatest rolled surface.

d For products of round cross section with a diameter ≥ 12 mm and < 16 mm or of rectangular cross section with the thickness b ≥ 5 mm and < 12 mm and a width a ≥ 12 mm sub-size test pieces shall be taken in accordance with 9.3.2.

9.3 Number of test pieces

9.3.1 Tensile test

For the tensile test at room temperature and at elevated temperatures one test piece each shall be taken per test unit and prepared in accordance with Tables 5 and 6 and EN 10002-1.

9.3.2 Impact test

For the impact test, three Charpy-V-notch test pieces shall be taken per test unit and prepared in accordance with Tables 5 and 6 and EN 10045-1.

If product thickness does not allow to prepare Charpy-V-notch test pieces with a width of 10 mm, subsize test pieces with a height of 10 mm and a width equal to the product thickness or equal to 5 mm or 7,5 mm shall be prepared.

The impact test shall not be required for specified thickness < 6 mm.

10 Test methods

10.1 Chemical analysis

The elements specified in Table 1 shall be determined. The choice of the suitable method for the analysis shall be at the discretion of the manufacturer. In the case of dispute the method to be used shall be agreed at the time of enquiry and order taking into account CR 10261.

10.2 Tensile test at room temperature

10.2.1 The tensile test at room temperature shall be carried out in accordance with EN 10002-1 taking into account the additional or deviating conditions specified for flat products in Table 5, footnote a, and for bars in Table 6, footnotes a and b.

10.2.2 The yield strength shall be determined as the upper yield strength (R_{eH}) or, if this is not pronounced, the 0,2 % proof strength ($R_{p0,2}$) shall be determined.

10.3 Impact test

10.3.1 The impact test shall be carried out in accordance with EN 10045-1 at the temperature given for the relevant steel in Table 3.

10.3.2 Where sub-size test pieces are used (see 9.3.2), the minimum impact energy values given in Table 3 shall be reduced in proportion to the cross-sectional area of the test piece.

10.3.3 The assessment of the results of the impact tests shall be based on a sequential method as follows.

a) The average value of a set of three test pieces shall meet the requirements specified in Table 3 (see also 10.3.2). One individual value may be below the specified value, provided that it is not less than 70 % of the value.

b) If the conditions under a) are not complied with an additional set of three test pieces shall be taken from the same sample and tested. To consider the test unit as acceptable, after testing the second set, the following conditions shall be satisfied simultaneously:

   — the average value of the six tests shall be greater than the specified minimum value;

   — not more than two of the six individual values shall be lower than the specified minimum value;

   — not more than one of the six individual values shall be lower than 70 % of the specified value.

If these conditions are not satisfied, the sample unit is rejected and retests are carried out on the remainder of the test unit.

10.4 Tensile test at elevated temperature

The tensile test at elevated temperature shall be carried out in accordance with EN 10002-5.

●● Unless another temperature of Table 4 is specified, the test shall be carried out at 300 °C.

10.5 Visual examination

The visual examination of the surface condition shall be carried out without optical aids.

10.6 Ultrasonic test

The requirements of EN 10160 apply.

10.7 Retests

The requirements of EN 10021 apply.

11 Marking

The products shall be marked by painting or low stress stamping or ink marking or durable adhesive labels or attached tags with the following:

— the manufacturers name or trade mark;

— the steel name;

— a number by which the cast and if an inspection certificate has been ordered the sample product can be identified.

Marking shall be at a position close to on one end of each product or on the end cut face at the manufacturer's discretion.

It is permissible for light products to be supplied in securely tied bundles. In this case the marking shall be on a label attached to the bundle or on the top product of the bundle.

Annex A
(informative)

Definition of "simple pressure vessel"

For defining the term "simple pressure vessel" the Article 1, clauses 2 and 3 of the Directive 87/404/EEC are cited in the following:

Article 1

2. For the purpose of this Directive, "simple pressure vessel" means any welded vessel subject to an internal gauge pressure greater than 0,5 bar which is intended to contain air or nitrogen and which is not intended to be fired.

Moreover,

— the parts and assemblies contributing to the strength of the vessel under pressure shall be made either of non-alloy quality steel or of non-alloy aluminium or non-age hardening aluminium alloys,

— the vessels shall be made of :

  — either a cylindrical part of circular cross section closed by outwardly dished and/or flat ends which revolve around the same axis as the cylindrical part,

  — or two dished ends revolving around the same axis;

— the maximum working pressure of the vessel shall not exceed 30 bar and the product of that pressure and the capacity of the vessel (PS·V) shall not exceed 10 000 bar•litre,

— the minimum working temperature must be no lower than – 50 °C and the maximum working temperature shall not be higher than 300 °C for steel and 100 °C for aluminium or aluminium alloy vessels.

3. The following vessels shall be excluded from the scope of the Directive:

— vessels specifically designed for nuclear use, failure of which may cause an emission of radioactivity,

— vessels specifically intended for installation in or the propulsion of ships and aircraft,

— fire extinguishers.

Annex ZA
(informative)

Relationship between this document and the Essential Requirements of EU Directive for Simple Pressure Vessels 87/404/EEC

This document has been prepared under a mandate given to CEN by the European Commission and the European Free Trade Association in order to support essential safety requirement(s) (ESR) of the Simple Pressure Vessel Directive 87/404/EEC by providing technical solutions for specific ESRs.

Once this document is cited in the Official Journal of the European Communities under that Directive and has been implemented as a national standard in at least one Member State, compliance with the clauses of this document given in Table ZA.1 confers, within the limits of the scope of this document, a presumption of conformity with the corresponding Essential Requirements of that Directive and associated EFTA regulations.

Table ZA .1 — Correspondence between this European Standard and Directive 87/404/EEC

Clauses/sub-clauses of this EN	Content	Simple pressure vessels directive 87/404/EEC, Annex I
6.1.2, 7.2, 7.3	Appropriate material properties	1.1 and 1.1.1
8 and 9	Documentation	1.1

WARNING — **Other requirements and other EU Directives may be applicable to the products falling within the scope of this document.**

Bibliography

EN 286-1, *Simple unfired pressure vessels designed to contain air or nitrogen — Part 1: Pressure vessels for general purposes.*

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

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

blank

BSI — British Standards Institution

BSI is the independent national body responsible for preparing British Standards. It presents the UK view on standards in Europe and at the international level. It is incorporated by Royal Charter.

Revisions

British Standards are updated by amendment or revision. Users of British Standards should make sure that they possess the latest amendments or editions.

It is the constant aim of BSI to improve the quality of our products and services. We would be grateful if anyone finding an inaccuracy or ambiguity while using this British Standard would inform the Secretary of the technical committee responsible, the identity of which can be found on the inside front cover. Tel: +44 (0)20 8996 9000. Fax: +44 (0)20 8996 7400.

BSI offers members an individual updating service called PLUS which ensures that subscribers automatically receive the latest editions of standards.

Buying standards

Orders for all BSI, international and foreign standards publications should be addressed to Customer Services. Tel: +44 (0)20 8996 9001. Fax: +44 (0)20 8996 7001. Email: orders@bsi-global.com. Standards are also available from the BSI website at http://www.bsi-global.com.

In response to orders for international standards, it is BSI policy to supply the BSI implementation of those that have been published as British Standards, unless otherwise requested.

Information on standards

BSI provides a wide range of information on national, European and international standards through its Library and its Technical Help to Exporters Service. Various BSI electronic information services are also available which give details on all its products and services. Contact the Information Centre. Tel: +44 (0)20 8996 7111. Fax: +44 (0)20 8996 7048. Email: info@bsi-global.com.

Subscribing members of BSI are kept up to date with standards developments and receive substantial discounts on the purchase price of standards. For details of these and other benefits contact Membership Administration. Tel: +44 (0)20 8996 7002. Fax: +44 (0)20 8996 7001. Email: membership@bsi-global.com.

Information regarding online access to British Standards via British Standards Online can be found at http://www.bsi-global.com/bsonline.

Further information about BSI is available on the BSI website at http://www.bsi-global.com.

Copyright

BSI
389 Chiswick High Road
London
W4 4AL