

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

The European Standard EN 10207 : 1992 with the incorporation of its amendment A1 : 1997 has the status of a British Standard

ICS 77.140.30

National foreword

This British Standard is the English language version of EN 10207 : 1991 including amendment A1 : 1997.

The UK participation in its preparation was entrusted to Technical Committee ISM/73, Steels 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 committee 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 Standards Catalogue under the section entitled 'International Standards Correspondence Index, or by using the 'Find' facility of the BSI Standards Electronic Catalogue.

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 14, an inside back cover and a back cover. All pages are issue 2.

Amendments issued since publication

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English version

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

(includes amendment A1 : 1997)

Aciers pour appareils à pression simple —
Conditions techniques de livraison des tôles,
bandes et barres
(inclut l'amendement A1 : 1997)

Stähle für einfache Druckbehälter — Technische
Lieferbedingungen für Blech, Band und Stabstahl
(enthält Änderung A1 : 1997)

This European Standard was approved by CEN on 30 November 1991. 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, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and United Kingdom.

CEN

European Committee for Standardization
Comité Européen de Normalisation
Europäisches Komitee für Normung

Central Secretariat: rue de Stassart 36, B-1050 Brussels

Foreword

This European Standard has been drawn up by Technical Committee ECISS/TC 22 Steels for pressure purposes' for the reasons given in clause 1.

ECISS/TC 22 accepted this document in its meeting in February 1990. The following ECISS member bodies were represented at that meeting: Austria, Belgium, France, Germany, Italy, Norway, Sweden and UK.

This European Standard EN 10207 was approved by CEN on 26 September 1991.

According to the CEN/CENELEC Internal Regulations, the following countries are bound to implement this European Standard: Austria, Belgium, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland, United Kingdom.

Foreword to amendment A1

This Amendment EN 10207 : 1991/A1 : 1997 to EN 10207 : 1991 has been prepared by Technical Committee ECISS/TC 22, Steels for pressure purposes — Qualities, the secretariat of which is held by DIN.

This Amendment to the EN 10207 : 1991 shall be given the status of a national standard, either by publication of an identical text or by endorsement, at the latest by January 1998, and conflicting national standards shall be withdrawn at the latest by January 1998.

In its meeting of 1995-03-03 ECISS/TC 22 decided to prepare an Amendment of EN 10207 in order to work in the new designations according to EN 10027-1 and CR 10260 as well as the steel numbers according to EN 10027-2. It is intended to check in 1997 if EN 10207 will be revised.

According to the CEN/CENELEC Internal Regulations, the national standards organizations of the following countries are bound to implement this Amendment: Austria, Belgium, Czech Republic, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and the United Kingdom.

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NOTE. The clauses marked with a point (•) contain information relating to agreements which are to be made on ordering. The clause marked with two points (••) contain information regarding agreements which may be made on ordering.

1 Scope

1.1 This European Standard has been established in order to provide complete technical delivery conditions for flat products and bars made of steel which must comply with the specifications for pressurized parts in simple pressure vessels as defined in the Directive 87/404/EEC/EEC (see annex A) and standardized in EN 286.

1.2 The general technical delivery conditions of EN 10021 also apply to deliveries in accordance with this European Standard.

2 Normative references

This European Standard incorporates by dated or undated reference provisions from other publications. These normative references are cited at the appropriate points in the text and the publications are listed hereafter. Subsequent amendments to, or revisions of, any of these publications apply to this European Standard only when incorporated in it by amendment or revision. In the case of undated references, the most recent edition of the publication referred to applies.

DIRECTIVE *Council directive of 25 June 1987
87/404/EEC* *on the harmonization of the laws
of the Member States relating to
simple pressure vessels*

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

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 temperature*

EN 10020 *Definition and classification of
grades of steel*

EN 10021 *General technical delivery
requirements for steel and iron
products*

EN 10027-1 *Designation systems for steels —
Part 1: Steel names, principal
symbols*

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

EN 10029	<i>Hot rolled steel plates 3 mm thick or above — Tolerances on dimensions, shape and mass</i>
EN 10045-1	<i>Metallic materials — Charpy impact test — Part 1: Test method</i>
EN 10048 ¹⁾	<i>Hot rolled narrow steel strip; tolerances on dimensions and shape</i>
EN 10051	<i>Continuously hot rolled uncoated sheet and strip of non-alloy and alloy steels — Tolerances on dimensions and shape</i>
EN 10052	<i>Vocabulary of heat treatment terms for ferrous products</i>
EN 10079	<i>Definitions of steel products</i>
EN 10160 ¹⁾	<i>Ultrasonic testing of steel flat products of thickness equal to or greater than 6 mm (reflection method)</i>
EN 10204	<i>Metallic products — Types of inspection documents</i>
EN 10221	<i>Surface quality classes for hot-rolled bars and rods — Technical delivery conditions</i>
EN ISO 377 ¹⁾	<i>Steel and steel products — Location and preparation of test pieces for mechanical testing</i>
EURONORM 58 ²⁾	<i>Hot rolled flats for general purposes</i>
EURONORM 59 ²⁾	<i>Hot rolled square bars for general purposes</i>
EURONORM 60 ²⁾	<i>Hot rolled round bars for general purposes</i>
EURONORM 61 ²⁾	<i>Hot rolled steel hexagons</i>
EURONORM 168 ²⁾	<i>Iron and steel products — Inspection documents — Contents</i>
ISO 14284	<i>Steel and iron — Sampling and preparation of samples for the determination of chemical composition</i>
CR 10260	<i>Designation systems for steel — Additional symbols for steel names (CEN-Report)</i>

¹⁾ In preparation; until this document is published as European Standard the corresponding national standard should be agreed at the time of enquiry and order

²⁾ Until this EURONORM is transformed into a European Standard, this EURONORM or a corresponding national standard may be applied, depending on the agreement at the time of enquiry and order (see annex A).

3 Definitions

For the purpose of this European Standard, the following definition applies in addition to the definitions in EN 10020, EN 10021, EN 10052, EN 10079 and EN 10204 (see clause 2):

simple pressure vessel

(See annex A.)

• 4 Dimensions and tolerances on dimensions

The nominal dimensions and tolerances on dimensions for the product shall be agreed on ordering with reference to the following dimensional standards:

4.1 In the case of hot rolled steel plates 3 mm thick or above with reference to.....EN 10029, thickness tolerance class B.

4.2 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 toEN 10051.

4.3 In the case of hot rolled narrow strip (rolled width < 600 mm) reference toEN 10048

4.4 In the case of bars with:

- rectangular section..... to EURONORM 58;
- square section to EURONORM 59;
- round section..... to EURONORM 60;
- hexagonal section to EURONORM 61.

5 Calculation of mass

A density of 7,85 kg/dm³ shall be used as the basis for the calculation of the nominal mass from the nominal dimensions of all steels included in table 1.

6 Designation and ordering

6.1 Designation of the steel grades

The steel names are allocated in accordance with EN 10027-1 and CR 10260; the steel numbers are allocated in accordance with EN 10027-2.

• 6.2 Ordering

The order of a product conforming to this EN shall include the following information:

- a) the quantity required;
- b) the product form;
- c) the European Standard or document specifying the tolerances on dimensions, shape and mass (see clause 4) 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;
- d) the nominal dimensions of the product to be delivered;
- e) the number of this EN;
- f) the name and number of the steel grade.

Special agreements regarding the subclauses marked with two points (••) may be made on ordering.

7 Classification and selection of steels

7.1 The classification of the steels according to EN 10020 is indicated in table 1.

• **7.2** The selection of steel is the responsibility of the purchaser.

8 Requirements

8.1 Steel manufacturing process

8.1.1 The steels shall be made using a basic oxygen process or an electric furnace process or by technically equivalent processes.

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

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

8.2 Delivery condition

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

8.3 Chemical composition

8.3.1 The chemical composition determined from the cast analysis shall comply with the requirements in table 1.

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

8.4 Mechanical properties

The requirements in tables 3 and 4 apply for test pieces taken, prepared and tested in accordance with 9.3 and 9.4. The values relate to the nominal thicknesses (thicknesses on ordering) of the products and apply to the delivery condition specified in 8.2.

8.5 Surface condition

8.5.1 For plates the requirements for surface quality class B 2 of EN 10163-2 shall apply.

• **8.5.2** For bars a surface quality class in accordance with EN 10221 shall be agreed at the time of ordering.

• 8.6 Internal soundness

For plates in thicknesses equal to or greater than 6 mm special agreements referring to internal soundness may be made on the basis of EN 10160 when ordering.

9 Inspection and testing**9.1 Required types and content of the inspection documents**

9.1.1 Unless otherwise agreed (see 9.1.2) on the basis of non-specific instructions a test report as defined in 2.2 of EN 10204 shall be issued with the following information:

- a) the information groups A, B and Z of EURONORM 168;
- b) the results of the cast analysis in accordance with the code numbers C 71 to C 92 in EURONORM 168;
- c) the data for a tensile test at room temperature in accordance with the code numbers C 01 to C 03 and C 10 to C 13 of EURONORM 168;
- d) for products of which Charpy-V-notch impact test pieces with a thickness of ≥ 5 mm and a width of 10 mm can be taken.

The data for such tests according to the code numbers C 01 to C 03 and C 40 to C 43 of EURONORM 168.

• **9.1.2** At the time of enquiry and order by requiring an inspection certificate of type 3.1 B of EN 10204 specific inspection and testing in accordance with the conditions in 9.2 to 9.5 may be agreed. The inspection certificate shall in this case contain the following information:

- a) } As under 9.1.1a and b.
- b) }
- c) } As under 9.1.1c and d. The data must
- d) } however stem from specific inspection and testing and shall therefore, where necessary, additionally cover the code number C 00 of EURONORM 168.
- e) The result of the visual examination of the products (see information group D of EURONORM 168).
- f) If one or more of the following optional tests were agreed when ordering the relevant information for :
 - f1) product analysis (code numbers C 71 to C 92 of EURONORM 168);
 - f2) the verification of the 0,2 % proof stress at elevated temperature (Code numbers C 00 to C 03, C 10 and C 11 of EURONORM 168);
 - f3) ultrasonic tests on internal soundness (information group D of EURONORM 168).

9.2 Test units and number of samples and test pieces for specific inspection and testing**• 9.2.1 Product analysis**

Product analysis shall be carried out if specified at the time of enquiry and order. The test unit is the cast. The purchaser shall specify the number of samples and the elements to be determined.

9.2.2 Tensile tests at ambient temperature and impact tests

9.2.2.1 If at the time of enquiry and order in accordance with 9.1.2 the issuing of an inspection certificate has been agreed, the test units presented for specific inspection of the tensile properties at ambient temperature and, where necessary (see 9.1.1d), the impact tests shall contain products of the same cast, the same production process, the same form and the same thickness range as specified in table 3 for the yield strength. The weight of the individual test units shall be 40 t or part thereof.

9.2.2.2 Per test unit one sample shall be taken.

9.2.2.3 Per sample one tensile test piece and, where possible (see 9.1.1d), three impact test pieces shall be taken per sample.

•• **9.2.3 Verification of the 0,2 % elevated temperature proof stress**

If specially agreed at the time of enquiry and order the 0,2 % elevated temperature proof stress shall be verified. In this case, unless otherwise agreed, one test piece per cast shall be tested.

9.2.4 Visual examination

Each product shall be examined.

•• **9.2.5 Ultrasonic tests**

If for plates in thicknesses ≤ 6 mm ultrasonic tests were specially agreed at the time of enquiry and order each plate shall be tested unless otherwise agreed. The tests may be carried out before the plates are cut to their final size.

9.3 Selection and preparation of samples and test pieces

9.3.1 General

The samples and test pieces shall be selected and prepared in accordance with the general conditions in ISO 14284 and EN ISO 377. In addition the following shall apply.

9.3.2 Position of the samples and test pieces for mechanical tests

9.3.2.1 For 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 corresponds approximately to the following:

- In the case of products with a rolled width (w) of ≥ 600 mmto $w/4$.
- In the case of products with a rolled width (w) of < 600 mm..... to $w/3$.

NOTE. The verification of the mechanical properties is normally carried out before slitting. In the unusual cases where their verification is required after slitting suitable measures shall as far as possible be taken 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 the rolled surface the indications in figure 1 apply.

9.3.2.2 For bars see figure 2.

9.3.3 Orientation of the axis of test pieces for mechanical tests

9.3.3.1 For flat products the specifications in figure 1 apply.

9.3.3.2 For bars longitudinal test pieces are to be taken in accordance with figure 2.

9.4 Test procedures

9.4.1 Products analysis

If a product analysis has been ordered, unless otherwise agreed on ordering, the choice of suitable physical or chemical analytical method shall be at the discretion of the manufacturer. In cases of dispute the analysis shall be carried out by a laboratory approved by both parties. In this case the analytical method to be used shall be agreed, if possible, with reference to corresponding European Standards or EURONORMs.

9.4.2 Tensile test at ambient temperature

9.4.2.1 The tensile test at ambient temperature shall be carried out in accordance with EN 10002-1 taking into account the additional or deviating conditions specified for flat products in figure 1, footnote 1, and for bars in figure 2, footnotes 1 and 2.

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

9.4.3 Impact test

9.4.3.1 The impact test on Charpy-V-notch test pieces shall be carried out as specified in EN 10045-1 at the temperature given for the relevant steel in table 3.

9.4.3.2 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 specified requirement. One individual value may be below the specified value, provided that it is not less than 70 % of that value.

b) If the conditions under a) are not complied with then 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:

- i) The average value of six tests shall be greater than the specified minimum value;
- ii) Not more than two of six individual values shall be lower than the specified minimum value;
- iii) 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.

9.4.3.3 If, because of a too small product thickness, it is not possible to prepare Charpy-V-notch test pieces with the normal 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 or 7,5 mm shall be tested and the applicable impact energy values shall be taken from figure 3. The impact energy shall not be verified for thicknesses below 5 mm.

9.4.4 0,2 % proof stress values at elevated temperatures

The 0,2 % proof stress values at elevated temperature specified in table 4 apply for test carried out in accordance with EN 10002-5. Verification, if required, shall be carried out at *one* of the temperatures given in table 4.

•• This temperature may be agreed on ordering; otherwise, the test shall be carried out at 300 °C.

9.4.5 Visual examination

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

9.4.6 Ultrasonic test

If an ultrasonic test has been agreed for plate of thickness ≥ 6 mm for checking the internal soundness, the requirements of EN 10160 shall apply.

9.5 Re-test

See EN 10021.

10 Marking

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

- the designation of the steel;
- a number by which the cast and, if an inspection certificate has been ordered, the sample product can be identified;
- the manufacturer's name or trademark.

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

•• Unless otherwise agreed at the time of enquiry and order, no hard stamping is permitted.

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.

Table 1. Chemical composition (cast analysis) and classification of the steels

Steel designation		Classification ¹⁾	% C max.	% Si max.	% Mn	% P max.	% S max.	% Al _{tot} min. ²⁾
Name	Number							
P235S	1.0112	UQ	0,16	0,35	0,40 to 1,20	0,035	0,030	0,020
P265S	1.0130	UQ	0,20	0,40	0,50 to 1,50	0,035	0,030	0,020
P275SL	1.1100	US	0,16	0,40	0,50 to 1,50	0,030	0,025	0,020

¹⁾ UQ = non-alloy quality steel; US = non-alloy special steel.

²⁾ If sufficient other nitrogen binding elements are present, the minimum total aluminium content does not apply. If such other nitrogen binding elements were added to the steel their content shall be given in the inspection document.

Table 2. Permissible deviations in the results of the product analysis from the values specified in table 1 for the lower or upper limits of the cast analysis

Element	Specified values for the cast analysis according to table 1 % by mass	Permissible deviation ¹⁾ of the product analysis from the values listed in table 1 for the cast analysis % by mass
C	$\leq 0,20$	+0,02
Si	$\leq 0,40$	+0,05
Mn	$\leq 1,00$ 1,00 to $\leq 1,50$	$\pm 0,05$ $\pm 0,10$
P	$\leq 0,035$	+0,005
S	$\leq 0,030$	+0,005
Al	$\geq 0,020$	-0,005

¹⁾ 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 maximum permitted value or fall short of the minimum permitted value. It is not acceptable for both to apply for one cast.

Table 3. Mechanical properties

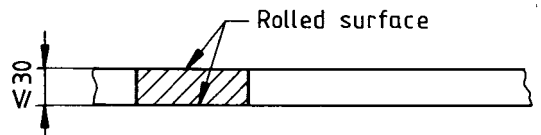
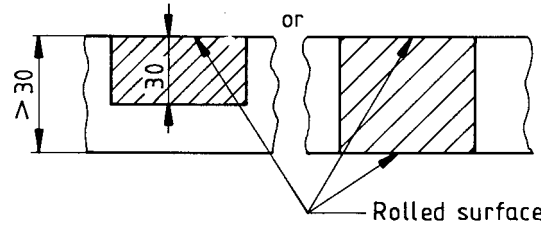
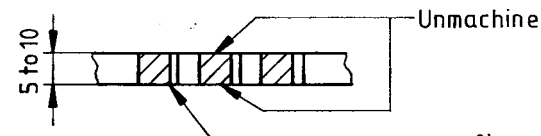
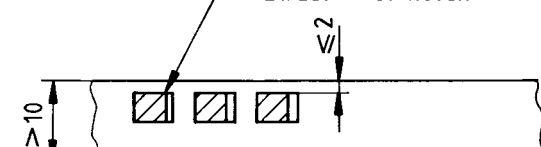
Steel designation		$R_{e,min}^{1)}$			$R_m^{1)}$	$A_{long; min^{1)2)}$				$KV_{long}^{1)}$	
Name	Number	for nominal thickness in mm				$L_o = 80 \text{ mm}$		$L_o = 5,65 \sqrt{S_o}$			
		≤ 16	≤ 16	≤ 40		nominal thickness in mm					
		≤ 16	≤ 40	≤ 60		> 2	$> 2,5$	> 3	> 40		
		N/mm ²	N/mm ²	N/mm ²	N/mm ²	$\leq 2,5$	< 3	< 40	≤ 60	at	min.
		N/mm ²	N/mm ²	N/mm ²	N/mm ²	%	%	%	%	°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

$R_{e,min}$	=	minimum yield strength (see 9.4.2.2)
R_m	=	tensile strength
$A_{long, min}$	=	minimum elongation at fracture for longitudinal tensile test pieces (see figure 1, footnote 1); L_O = gauge length; S_o = area of the cross-section within the gauge length
$KV_{long, min}$	=	minimum impact energy for longitudinal Charpy-V-notch impact test pieces (see 9.4.3)

²⁾ If for flat products in rolled width of ≥ 600 mm in accordance with figure 1 transverse tensile test pieces are tested the minimum values for the elongation at fracture are by 2 units lower than the minimum values specified above for longitudinal test pieces.

Table 4. 0,2 % proof stress at elevated temperatures

Steel designation		Product thickness	0,2 % proof stress at				
Name	Number		100 °C N/mm ²	150 °C N/mm ²)	200 °C N/mm ²)	250 °C N/mm ²)	300 °C N/mm ²)
			mm	min.	min.	min.	min.
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 ≤ 60	212	194			

Type of test	Thickness of product mm	Orientation of the test pieces for rolled width of		Distance of the test piece from the rolled surface mm
		< 600 mm	≥ 600 mm	
Tension ¹⁾	≤ 30	longitudinal	transverse	
	> 30			
Impact ²⁾	≥ 5 ≤ 10	longitudinal	longitudinal	
	> 10			

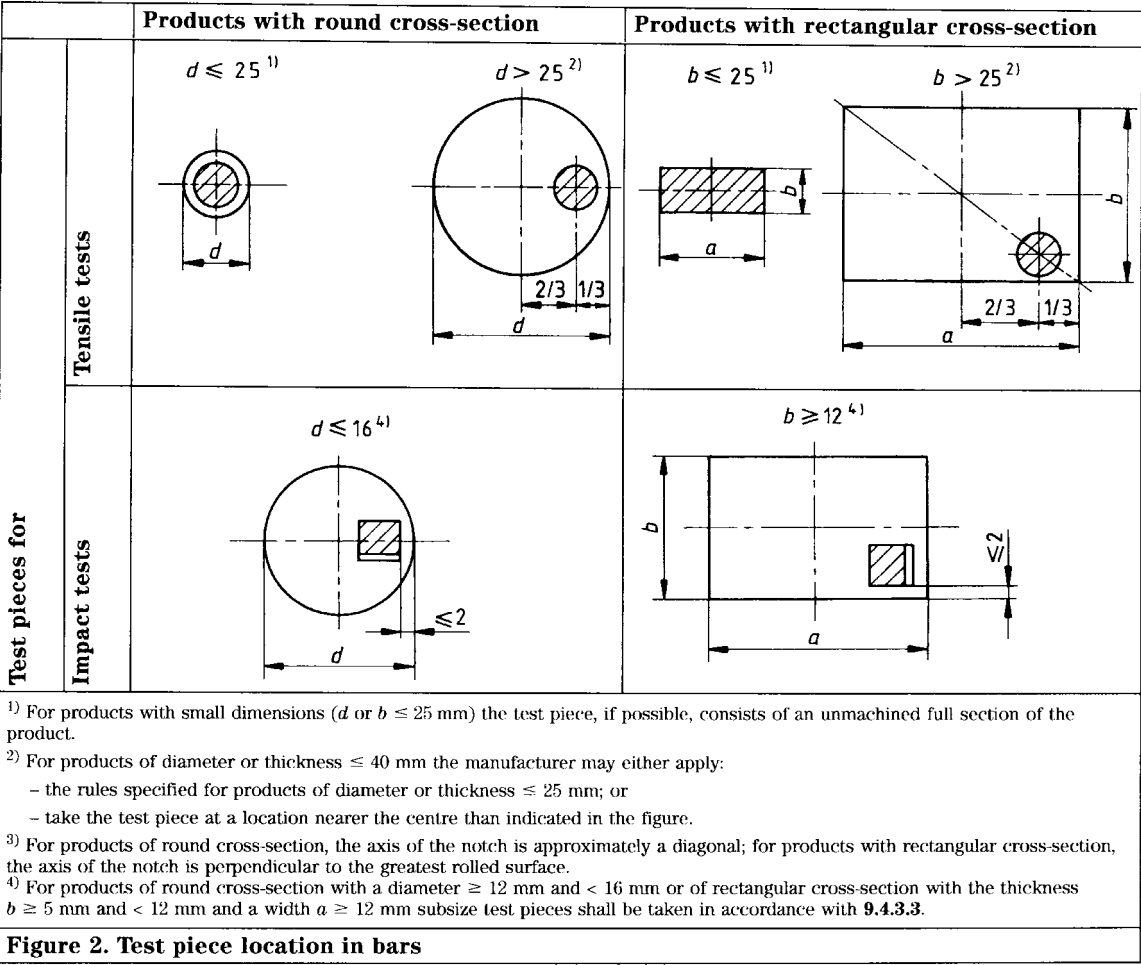
¹⁾ In case of doubt or dispute, for products of thickness greater than or equal to 3 mm use proportional test pieces of gauge length $L_0 = 5,65 \sqrt{S_0}$. For normal testing, for reasons of economy, test pieces of a constant measuring length may be used provided the result obtained for elongation after breaking is converted by a recognized formula (see, for example, ISO 2566 — *Conversion of elongation values*).

For products of thickness greater than 30 mm a round test piece may be used if agreed between the parties.

²⁾ The axis of the notch shall be perpendicular to the surface of the product.

³⁾ Or machined to, if possible, 7,5 otherwise 5 mm (see 9.4.3.3).

Figure 1 Test piece location for flat products (see further details in 9.3.2)



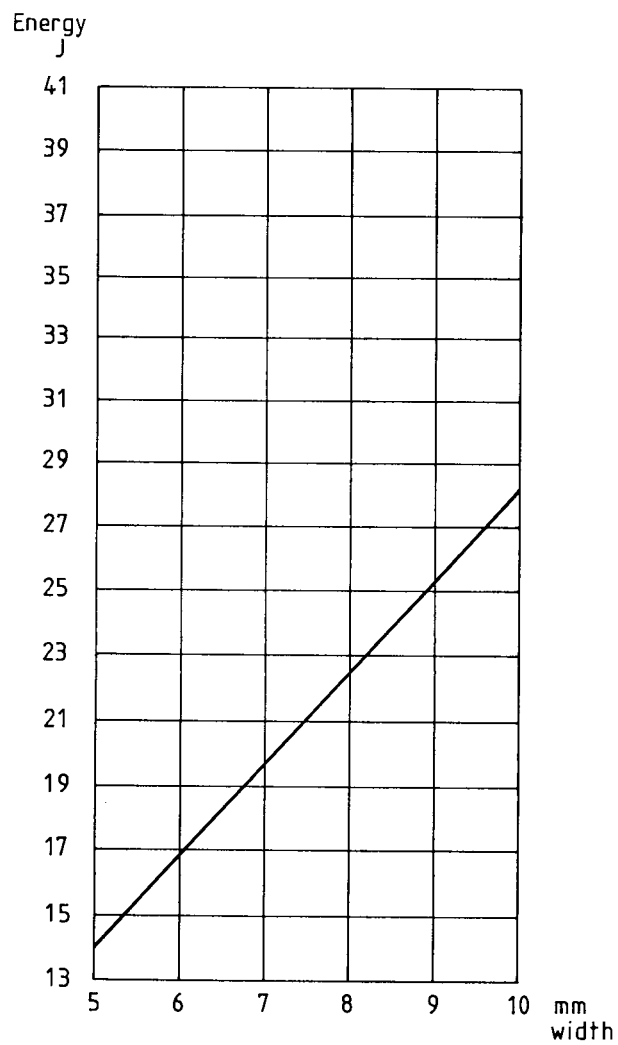


Figure 3. Minimum impact energy values (J) for impact test pieces with a width between 5 and 10 mm

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 purposes of this Directive, 'simple pressure vessel' means any welded vessel subjected 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 vessel 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 propulsion of ships and aircraft,
 - fire extinguishers.

Annex B (informative)

List of national standards which correspond with Euronorms referenced

Until the following Euronorms are transformed into European Standards, they can either be implemented or reference made to the corresponding national standards as listed in table B.1.

Table 12 Euronorms with corresponding national standards											
Euronorm	Corresponding national standard in										
	Germany	France	United Kingdom	Spain UNE	Italy	Belgium NBN	Portugal NP-	Sweden	Austria	Norway	
58	DIN 1017 T1	NF A 45 005 ¹⁾	BS 4360	UNE 36-543	UNI-EU 58	A 34-201	—	SS 21 21 50	M 3230	1902	
59	DIN 1014 T1	NF A 45 004 ¹⁾	BS 4360	UNE 36-542	UNI-EU 59	A 34-202	333 + 334	SS 21 27 25	M 3226	1901	
60	DIN 1013 T1	NF A 45 003 ¹⁾	BS 4360	UNE 36-541	UNI-EU 60	A 34-203	331	SS 21 25 02	M 3221	1900	
61	DIN 1015	NF A 45 006 ¹⁾	BS 970	UNE 36-547 UNE 07-278	UNI 7061	A 34-204	—	—	M 3237/M 3228	—	
168		NF A 03 116	BS 1501 BS 1502	UNE 36-800	UNI-EU 168	—	—	SS 11 00 12	—	—	
¹⁾ NF A 45 001 and NF45A 101 shall be added for the tolerances.											

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