BRITISH STANDARD

BS EN
12811-2:2004

Temporary works equipment —

Part 2: Information on materials

The European Standard EN 12811-2:2004 has the status of a British Standard

ICS 91.220

National foreword

This British Standard is the official English language version of EN 12811-2:2004.

The UK participation in its preparation was entrusted by Technical Committee B/514, Access and support equipment, to Subcommittee B/514/21, Access and working scaffolds and their components (props, tubes and couplers), 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.

Additional information

As stated in the Scope of EN 12811-2:2004, this standard "...provides guidance on where to find information on materials often used in temporary works." It lists standards and provides information concerning the more commonly used steel, aluminium alloys, cast iron, timber and timber based materials. The Scope of EN 12811-2:2004 also states that the standard "draws attention to a number of points that a designer should take into account".

It does not purport to be exhaustive.

Almost all the information given in this standard has been selected from the standards referenced. The information in these referenced standards may be amended or revised as circumstances dictate. The latest versions of the referenced standards will themselves contain the full information, in context, to be used.

8.1 gives three classes of corrosion protection for ferrous metal products. The friction values of corrosion protection outside these classes may differ significantly from one another, particularly in the case of more modern corrosion protection treatments, such as non-electrolytically applied zinc flake coatings.

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.

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Equipements temporaires de chantiers - Partie 2: Information concernant les matériaux

Temporäre Konstruktionen für Bauwerke - Teil 2: Informationen zu den Werkstoffen

This European Standard was approved by CEN on 17 December 2003.

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 Management Centre 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 Management Centre has the same status as the official versions.

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Foreword

This document (EN 12811-2:2004) has been prepared by Technical Committee CEN/TC 53 “Temporäre Baukonstruktionen”, 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 August 2004, and conflicting national standards shall be withdrawn at the latest by August 2004.

This European Standard EN 12811 consists of the following parts under the general title: Temporary works equipment:

- Part 1: Scaffolds - Performance requirements and general design
- Part 2: Information on materials
- Part 3: Load testing

Annex A is informative.

This document includes a Bibliography.

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.

Introduction

This European Standard represents a supporting standard for product standards produced by CEN/TC 53.

It takes into account the material-related comments on the following drafts obtained in the CEN-enquiry:

prEN 12810-1:1997*, Façade scaffolds made of prefabricated components — Part 1: Product specifications.*

prEN 12810-2, *Façade scaffolds made of prefabricated components - Part 2: Particular methods of structural design*

prEN 12811:1997, *Scaffolds — Performance requirements and general design.*

prEN 12812:1997, *Falsework — Performance requirements and general design.*

prEN 12813:1997*, Load bearing towers made of prefabricated elements — Methods of particular design and assessment.*

prEN 13331-1:1998, *Trench lining systems — Part 1: Product specifications.*

prEN 13331-2:1998, *Trench lining systems — Part 2: Assessment by calculation or test*.

prEN 13377:1998, *Prefabricated timber formwork beams — Requirements, classification and assessment.*

This standard is limited to the selection of types and grades of material from standards, which are either international or European standards. However, in the field of temporary works equipment the use of other materials can be indicated or even imperative.

The use of non standardised (new) materials can give advantage for particular components. But this use prevents the marking of the product conforming in other respects to the product standard with the number of the respective product standard.

The components of temporary works equipment are used for many years. There are components in the stores of the users and on building sites which are made of materials corresponding to former national standards.

This standard does not intend to prevent neither the use of non standardised (new) materials nor the use of components made of old materials.

It is beyond the scope and the competence of CEN/TC 53 to formulate regulations for non standardized new materials and for old materials former standardized nationally.

In the absence of a European product directive for temporary works equipment, such regulations and their mutual acknowledgement are reserved to the single European country.

For closing the gap until a European regulation is available, the following recommendations are given:

1. The single country could add a national foreword to this standard, which regulates the further use of components, made of old materials for its jurisdiction.

2. The Working Groups of CEN/TC 53 could include a requirement in their product standards that also products made partially of materials not covered by ISO or EN standards may have the number of the product standard, if they are marked with an asterisk additionally and if the fact is recorded in the product manual.

1 Scope

This European Standard provides guidance on where to find information on materials often used in temporary works. It draws attention to a number of points that a designer should take into account.

The information given is limited to commonly used steel, aluminium alloys, cast iron, timber and timber based materials.

Requirements are also given for welding, for limiting corrosion and other deterioration.

It is limited to the selection of types and grades of material from standards, which are either international or European Standards.

2 Normative references

This European Standard 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 European Standard only when incorporated in it by amendment or revision. For undated references the latest edition of the publication referred to applies (including amendments).

EN 301, *Adhesives, phenolic and aminoplastic, for load-bearing timber structures - Classification and performance requirements.*

EN 336, *Structural timber — Sizes, permitted deviations.*

EN 338, *Structural timber — Strength classes.*

EN 390, *Glued laminated timber — Sizes — Permissible deviations.*

EN 729-1, *Quality requirements for welding — Fusion welding of metallic materials — Part 1: Guidelines for selection and use.*

EN 1562, *Founding — Malleable cast irons.*

EN 1563, *Founding — Spheroidal graphite cast irons.*

EN 10142, *Continuously hot-dip zinc coated low carbon steels strip and sheet for cold forming — Technical delivery conditions.*

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

ENV 1993-1-1, *Eurocode 3: Design of steel structures — Part 1-1: General rules and rules for buildings.*

ENV 1993-1-3, *Eurocode 3: Design of steel structures — Part 1-3: General rules - Supplementary rules for cold formed thin gauge members and sheeting.*

ENV 1995-1-1, *Eurocode 5: Design of timber structures — Part 1-1: General rules and rules for buildings.*

ENV 1999-1-1:1998, *Eurocode 9: Design of aluminium structures — Part 1-1: General rules - General rules and rules for buildings.*

EN ISO 1461*; Hot dip galvanized coatings on fabricated iron and steel articles - Specifications and test methods (ISO 1461:1999).*

EN ISO 12944 – Parts 1 to 8, *Paints and varnishes — Corrosion protection of steel structures by protective paint systems.*

3 General

3.1 Selection of materials

Material used shall be sufficiently robust and durable to withstand normal working conditions.

Materials shall be free from any impurities and defects, which may affect their satisfactory use.

Materials shall be selected from European or International Standards.

NOTE Commonly used materials are listed in annex A.

3.2 Characteristic values

The minimum values for yield stress or proof stress and for the tensile strength specified in material standards shall be used as characteristic values in design calculations.

3.3 Inspection documents

Materials for components, which affect the load bearing behaviour and/or health and safety aspects, shall be delivered with an inspection document in accordance with EN 10204. The minimum level shall be 2.2.

3.4 Effects of fabrication

Account shall be taken of forming or other fabrication techniques such as welding which can affect the material properties. For example, for steel the yield stress could be raised and the ductility could be reduced by these operations.

4 Steel

4.1 General

The commonly used materials are listed in Table A.1 and Table A.2. In addition, requirements are given in ENV 1993-1-1 and ENV 1993-1-3.

Some material values are given in Table 1.

Table 1 — Material values for steel

Modulus of elasticity, *E* MPa	**Shear modulus, *G*** MPa	**Coefficient of linear thermal expansion** α $\frac{1}{K}$	**Density** $\frac{\text{kg}}{\text{m}^3}$
210000	81000	$1{,}2 \times 10^{-5}$	7850
1 MPa = 1 N/mm^2			

4.2 Dimensions, mass and tolerance

Dimensions, mass and tolerances shall be in accordance with the material standard specified.

4.3 Fracture toughness

When structures are used at temperatures below – 20 °C, impact resistant material shall be used. For advice and for reference temperature related to maximum thickness see ENV 1993-1-1.

4.4 Steel grades in EN 10142

For design purposes, the steel grades in EN 10142 shall be considered to have a yield stress of 140 N/mm² and a tensile strength of 270 N/mm².

5 Cast iron

5.1 General

Malleable cast iron in accordance with EN 1562 or spheroidal graphite cast iron in accordance with EN 1563 shall be used.

When welding whiteheart malleable cast iron EN-GJMW-360-12 should be used.

Due to ductility requirements the elongation for spheroidal graphite cast iron shall be limited to $A_5 \geq 12\ \%$, for malleable cast iron to $A_{3,4} \geq 7\ \%$.

Some material values are given in Table 2.

Table 2 — Material values for cast iron

Cast iron	Modulus of elasticity, *E* MPa	Poisson's ratio	Coefficient of linear thermal expansion α $\frac{1}{K}$	Density $\frac{\text{kg}}{\text{m}^3}$
Spheroidal graphite	169000	0,275	$1{,}25 \times 10^{-5}$	7100
malleable	180000	0,275	$1{,}1 \times 10^{-5}$	7400
1 MPa = 1 N/mm^2				

5.2 Prototype testing

If the load bearing capacity and/or stiffness is determined by testing of a component made partially or totally of cast iron, a metallographic record (macrographs and micrographs) of the component being tested shall be obtained for reference purpose.

5.3 Inspection document

Cast irons shall be subjected to specific inspection and testing and issued with an inspection document type 3.1 B in accordance with EN 10204.

6 Aluminium alloys

6.1 General

The commonly used aluminium alloys are given in Table A.3 and Table A.4. In addition, requirements are given in ENV 1999-1-1.

Some material values are given in Table 3.

Table 3 — Material values for aluminium alloys

Modulus of elasticity, *E* MPa	**Shear modulus, *G*** MPa	**Coefficient of linear thermal expansion** α $\frac{1}{K}$	**Density** $\frac{\text{kg}}{\text{m}^3}$
70000	27000	$2{,}3 \times 10^{-5}$	2700
1 MPa = 1 N/mm^2			

6.2 Dimensions, mass and tolerance

Dimensions, mass and tolerances of structural extruded products, sheet and plate products, drawn tube, electrically welded tube, wire and forging, shall conform with the European Standards listed in ENV 1999-1-1.

6.3 Heat affected zones

The values given in annex A are only valid for unaffected material. Welding affects a reduction of the strength properties of the material in the vicinity of the welds. The reduction affects the 0,2 % proof stress of the material more severely than the ultimate tensile strength. For design purposes it is assumed that throughout the heat affected zone (HAZ) the strength properties are reduced by a constant factor ρ_{haz}.

NOTE ρ_{haz} can be chosen following ENV 1999-1-1.

6.4 Inspection document

The performance of aluminium alloys not listed in ENV 1999-1-1 shall be subjected to specific inspection and testing and issued with an inspection document 3.1.B in accordance with EN 10204.

7 Timber and timber based materials

7.1 General

Materials specified in ENV 1995-1-1 shall be used. Service class 2 is the most appropriate.

7.2 Solid timber and glued laminated timber

7.2.1 General

For solid timber coniferous or poplar wood with a minimum strength class C16 in accordance to EN 338 shall be used. The glue used for glued laminated timber and timber based materials shall meet the requirements of Type I of EN 301.

7.2.2 Characteristic values

For the structural design of components of solid timber and glued laminated timber the characteristic values of the respective strength class in accordance with EN 338 shall be used, see also Table A.5 and Table A.6.

7.2.3 Dimensions, mass and tolerance

The effective cross-section and geometrical properties shall be calculated from the target size provided that the following tolerance classes are used:

Solid timber:

— Tolerance class 1 to EN 336 target size relates to a timber moisture of 20 %.

Glued laminated timber:

— Tolerances to EN 390 target size related to a timber moisture of 12 %.

7.3 Wood-based materials (plywood, particleboard, fibreboard)

7.3.1 General

Wood based materials shall be produced so that it maintains its integrity and strength in the assigned service class throughout the expected life of the structure. Plywood used for platforms shall also meet the following requirements:

— Construction of platforms: The top layer shall have a minimum thickness of 0,8 mm, the intermediate ones may have 2,0 mm maximum thickness, measured in final condition. The top layer in uncoated condition shall be free of defects like loose knots, fissures and splits.

— Surface conditions: The platforms used as scaffold decks shall have a slip resistant and abrasion resistant coating.

8 Protection against corrosion and deterioration

8.1 Ferrous metal products

Corrosion protection for ferrous metal products shall conform to the classes given below:

Class	Corrosion protection
C1	Protective paint in accordance with EN ISO 12944 part 1 to 8.

C2 Hot dip galvanised coatings and similar methods

a) Area orientated components (like decks, tubes, standards,..)

Thickness of the coat: $\geq 28\,\mu m$ $(\cong 200 g/m^2)$

b) Small components (like fittings, bolts, nuts, washers, pins,..)

Thickness of the coat: $\geq 15\,\mu m$ average

C3 Hot dip galvanised in accordance with EN ISO 1461 T

Thickness of the coat: $\geq 50\,\mu m$.

8.2 Aluminium alloys

In normal areas of use, aluminium alloys do not require surface protection. Information on corrosion protection for structures in exposed environment, e.g. near to the sea, chemical works or where electrolytic action can occur, is given in ENV 1999-1-1.

8.3 Plywood for scaffold decks

Plywood shall be protected against wood damaging fungus (Basidiomyceten) during fabrication with a suitable wood preserver if the plywood is not of high resistance.

The edges of plywood panels shall be equipped with a permanently elastic sealing.

This sealing also shall be pervious to the diffusion of vapour.

For example acrylic-latex layers may be used; minimum thickness of the layer: ≥ 30 μm.

9 Welding

Welding shall be carried out in accordance with EN 729-1.

Annex A
(informative)

Information taken from other material and design standards

In Tables A.1 to A.6, this annex gives specific information and guidance on the location of requirements and values given in material and design standards.

Table A.1 — Steel - Nominal values for tubes and hollow sections

Steel to	Nominal steel grade	Yield strength, R_{eH} N/mm^2	Ultimate tensile strength, R_m N/mm^2	
		For nominal wall thickness $t \leq 16$ mm	For nominal wall thickness $t \leq 4$ mm	
EN 39: 2001	S235	235	340-520	
			t < 3 mm	**3 mm < $t \leq$ 65 mm**
EN 10210-1:1994	S235	235	360 – 510	340 – 470
	S275	275	430 – 580	410 – 560
	S355	355	510 – 680	490 – 630
			t < 3 mm	**3 mm < $t \leq$ 40 mm**
EN 10219-1:1997	S235	235	360 – 510	340 – 470
	S275	275	430 – 580	410 – 560
	S355	355	510 – 680	490 – 630
NOTE Other tube standards are EN 10296-1 and EN 10297-1				

Table A.2 — Steel - Nominal values for profiles, sheet and strip products

Steel to	Nominal steel grade	Yield strength, R_{eH} N/mm^2	Ultimate tensile strength, R_m N/mm^2
		For nominal thickness ≤ 3 mm	For nominal thickness ≤ 3 mm
EN 10025:1993	S235	235	360
	S275	275	430
	S355	355	510
EN 10113-2:1993	S275N	275	390
	S355N	355	490
	S420N	420	520
	S460N	460	550
EN 10147:2000 (zinc coated)	S 250 GD	250	330
	S 280 GD	280	360
	S 320 GD	320	390
	S 350 GD	350	420

Table A.3 — Aluminium - Nominal values for plates and sheets (taken from EN 485-2)

Alloy To	Fabrication stage	Thickness, t mm over	Thickness, t mm up to	Proof strength, $f_{0,2}$, 0,2 % N/mm^2	Ultimate strength, f_u, N/mm²	Minimum elongation, A %
EN AW-7020	T6, T651	0,4	12,5	280	350	7
EN AW-6082	T6, T651, T62	0,4 6	6 12,5	260 255	310 300	6 9
	T6151	0,4	12,5	205	280	10
EN AW-6061	O	0,4	25,0	≤ 85	150	14 - 16[a]
	T4/T451	0,4	12,5	110	205	12 - 18[a]
	T451	12,5	80,0	110	205	14 - 15[a]
	T42	0,4	80,0	95	205	12 - 18[a]
	T6/T651/T62	0,4	12,5	240	290	6 - 10[a]
	T651/T62	12,5	100,0	240	290	4 - 8[a]
EN AW-5754, EN AW-5049	O/H111	0,2	100	80	190	12
	H24/H34	0,2	25	160	240	6
EN AW-5086	F	2,5	150,0	---	240	---
	O/H111	0,2	150,0	100	240	11 –16[a]
	H112	6,0	12,5	125	250	8
		12,5	40,0	105	240	9
		40,0	80,0	100	240	12
	H116	1,5	50,0	195	275	8 - 10[a]
	H12	0,2	40,0	200	275	3 - 7[a]
	H14	0,2	25,0	240	300	2 - 3[a]
	H16	0,2	4,0	270	325	1 - 2[a]
	H18	0,2	3,0	290	345	1
	H22/H32	0,2	40,0	185	275	5 - 10[a]
	H24/H34	0,2	25,0	220	300	4 - 8[a]
	H26/H36	0,2	4,0	250	325	2 - 3[a]
EN AW-5083	H116	1,5	40	215	305	8
	H24/H34	1,5	25	250	340	6
	O/H111	0,2	50	125	275	11

[a] Minimum elongation depends from the thickness

— For sheet, strip and plate products, values are given in Table 3.2.a of ENV 1999-1-1:1998;

— For extruded rod/bar, extruded tube and extruded profiles and drawn tube values are given in Table 3.2.b of ENV 1999-1-1:1998;

— For electrically welded tubes values are given in Table 3.2.c of ENV 1999-1-1:1998;

— For forgings values are given in Table 3.2.d of ENV 1999-1-1:1998.

Table A.4 — Aluminium - Nominal values for extruded tubes and extruded profiles (taken from EN 755-2)

Alloy according to	Product form	Fabrication-stage	Dimension *t*/ Wall-thickness or thickness mm	Proof strength, $f_{0,2}$, 0,2 % N/mm²	Ultimate strength, f_u, N/mm²	Minimum elongation, *A* %
EN AW 7020	EP/ER/B, DT,ET	T6	$t < 15$	280	350	10
EN AW 6082	EP/O, EP/H	T5	$t < 5$	230	270	8
	EP/O, EP/H, ET	T6	$t < 5$	250	290	8
			$5 < t < 25$	260	310	10
	ER/B	T6	$t < 20$	250	295	8
	DT	T6	$t < 5$	255	310	8
EN AW 6063	ET, ER/B	T66	$t \leq 25$	200	245	10
	EP		$t \leq 10$	200	245	8
			$10 < t \leq 25$	180	225	8
EN AW 6060	EP	T66	$t < 3$	160	215	8
			$3 < t < 25$	150	195	8
	ET		$t < 15$	160	215	8
	ET,EP,ER/B	T6	$t < 15$	140	170	8
	DT		$t < 20$	160	215	12
EN W 6005A	EP/O	T6	$t < 5$	225	270	8
			$5 < t < 10$	215	260	8
			$10 < t < 25$	200	250	8
	EP/H		$t < 5$	215	255	8
			$5 < t < 15$	200	250	8
EN AW 5754A	ET, EP, ER/B	H112	$t < 25$	80	180	14
	ET	O				
EN AW 5083	ET,EP,ER/B	F,H112	$t < 20$	110	270	12
	DT	H12,H22,H32	$t < 10$	200	280	6

Key

EP - Extruded profiles
EP/H - Extruded hollow profiles
ER/B - Extruded rod and bar
EP/O - Extruded open profiles
ET - Extruded tube
DT - Drawn tube

Table A.5 — Structural timber - Strength classes and characteristic values to EN 338 for coniferous and poplar

Strength class		C16	C24	C30
		Strength values in N/mm^2		
Bending	$f_{m,k}$	16	24	30
Tension II	$f_{t,0,k}$	10	14	18
Tension ⊥	$f_{t,90,k}$	0,3	0,4	0,4
Compression II	$f_{c,0,k}$	17	21	23
Compression ⊥	$f_{c,90,k}$	4,6	5,3	5,7
Shear	$f_{v,k}$	1,8	2,5	3,0
		Stiffness values in N/mm^2		
Modulus of elasticity, mean value II	$E_{0,mean}$	8000	11000	12000
Modulus of elasticity II, 5 – percentile value	$E_{0,05}$	5400	7400	8000
Modulus of elasticity ⊥, mean value	$E_{90,mean}$	270	370	400
Shear modulus, mean value	G_{mean}	500	690	750
		Mass density in kg/m^3		
Mass density, mean value	ρ_{mean}	370	420	460

Table A.6 — Glued laminated timber - Strength classes and characteristic values to EN 1194 for no less then 4-layered glued laminated timber of conifers

Strength class		GL24		GL28		GL32	
		C[a]	h[b]	c[a]	h[b]	c[a]	h[b]
Strength values in N/mm^2							
Bending	$f_{m,k}$	24		28		32	
Tension II	$f_{t,0,k}$	14	16,5	16,5	19,5	19,5	22,5
Tension ⊥	$f_{t,90,k}$	0,35	0,4	0,4	0,45	0,45	0,5
Compression II	$f_{c,0,k}$	21	24	24	26,5	26,5	29
Compression ⊥	$f_{c,90,k}$	2,4	2,7	2,7	3,0	3,0	3,3
Shear	$f_{v,k}$	2,2	2,7	2,7	3,2	3,2	3,8
Stiffness values in N/mm^2							
Modulus of Elasticity, mean value	$E_{0,mean}$	11600		12600		13700	
Modulus of Elasticity II, 5 – percentile value	$E_{0,05}$	9400		10200		11100	
Modulus of Elasticy ⊥, mean value	$E_{90,mean}$	320	390	390	420	420	460
Shear modulus, mean value	G_{mean}	590	720	720	780	780	850
Mass density in kg/m^3							
Mass density, mean value	ρ_{mean}	350	380	380	410	410	430

[a] Combined glued laminated timber made of laminates of two different strength classes resp. grading classes.

[b] Homogeneous glued laminated timber made of laminates of uniform strength class resp. grading class.

Bibliography

EN 39:2001 *Loose steel tubes for tube and coupler scaffolds - Technical delivery conditions.*

EN 287-1, *Approval testing of welders — Fusion welding — Part 1: Steels (includes Amendment A1:1997).*

EN 287-2, *Approval testing of welders — Fusion welding — Part 2: Aluminium and aluminium alloys (includes Amendment A1:1997).*

EN ISO 15607, *Specification and qualification of welding procedures for metallic materials - General rules (ISO 15607:2003)*

EN 386, *Glued laminated timber — Performance requirements and minimum production requirements.*

EN 408, *Timber structures - Structural timber and glued laminated timber — Determination of some physical and mechanical properties.*

EN 485-2, *Aluminium and aluminium alloys — Sheet, strip and plate — Part 2: Mechanical properties.*

EN 719, *Welding coordination — Tasks and responsibilities.*

EN 729-2, *Quality requirements for welding — Fusion welding of metallic materials — Part 2: Comprehensive quality requirements.*

EN 729-3, *Quality requirements for welding — Fusion welding of metallic materials — Part 3: Standard quality requirements.*

EN 755-2, *Aluminium and aluminium alloys — Extruded rod/bar, tube and profiles — Part 2: Mechanical properties.*

EN 1179, *Zinc and zinc alloys — Primary zinc.*

EN 1193, *Timber structures — Structural timber and glued laminated timber — Determination of shear strength and mechanical properties perpendicular to the grain.*

EN 1194, *Timber structures — Glued laminated timber — Strength classes and determination of characteristic values.*

EN 1418, *Welding personnel — Approval testing of welding operators for fusion welding and resistance weld setters for fully mechanized and automatic welding of metallic materials.*

EN 10025:1990, *Hot rolled products of non-alloy structural steels — Technical delivery conditions (includes amendment A1:1993).*

EN 10113-2:1993, *Hot-rolled products in weldable fine grain structural steels — Part 2: Delivery conditions for normalized/normalized rolled steels.*

EN 10147:2000, *Continuously hot-dip zinc coated structural steels strip and sheet — Technical delivery conditions.*

EN 10210-1:1994*; Hot finished structural hollow sections of non-alloy and fine grain structural steels - Part 1: Technical delivery requirements.*

EN 10219-1:1997*; Cold formed welded structural hollow sections of non-alloy and fine grain steels - Part 1: Technical delivery requirements.*

EN 10242, *Threaded pipe fitting in malleable cast iron.*

EN 10296-1; *Welded circular steel tubes for mechanical and general engineering purposes - Technical delivery conditions - Part 1: Non-alloy and alloy steel tubes*.

EN 10297-1*; Seamless circular steel tubes for mechanical and general engineering purposes - Technical delivery conditions - Part 1: Non-alloy and alloy steel tubes.*

EN 1990*, Eurocode - Basis of structural design.*

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