



SLOVENSKI STANDARD
oSIST prEN 10249-1:2006
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Hladno oblikovane zagate iz nelegiranih jekel - 1. del: Tehnični dobavni pogoji

Cold formed steel sheet piling - Part 1: Technical delivery conditions

Kaltgeformte Spundbohlen aus unlegierten Stählen - Teil 1: Technische Lieferbedingungen

Palplanches en acier formées a froid - Partie 1: Conditions techniques de livraison

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77.140.70	Jekleni profili	Steel profiles

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Cold formed steel sheet piling - Part 1: Technical delivery conditions

This draft European Standard is submitted to CEN members for enquiry. It has been drawn up by the Technical Committee ECISS/TC 10.

If this draft becomes a European Standard, 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.

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Foreword

This document (prEN 10249-1:2006) has been prepared by Technical Committee ECISS/TC 10 “Structural steels - Grades and qualities”, the secretariat of which is held by NEN.

This document is currently submitted to the CEN Enquiry.

This document will supersede EN 10249-1:1995.

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 the EU Construction Products Directive(89/106/EEC).

For relationship with EU Construction Products Directive (89/106/EEC), see informative Annex ZA, which is an integral part of this document.

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prEN 10249-1:2006 (E)**1 Scope**

This part of this European Standard specifies the requirements for cold formed non alloy and alloy steel sheet piling produced from hot rolled strip or sheet with a thickness equal to or greater than 2 mm in respect of its chemical composition, mechanical and technological properties and delivery conditions.

The products specified are for general, structural and civil engineering works.

Requirements concerning the tolerances on shape and dimensions are specified in Part 2 of 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 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 1011-2, *Welding – Recommendations for welding of metallic materials – Part 2 : Arc welding of ferritic steels*

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

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

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

EN 10025-2, *Hot rolled products of structural steels – Part 2 : Technical delivery conditions for non alloy structural steels.*

EN 10027-1, *Designation system for steel - Part 1 : Steel names principal symbols.*

EN 10027-2, *Designation system for steel - Part 2 : Steel numbers.*

EN 10079, *Definition of steel products.*

EN 10111, *Hot rolled non coated mild unalloyed sheet and strip for cold forming. Technical delivery conditions*

rEN 10149-1, *Hot rolled flat products made of high yield strength steels for cold forming - Part 1 : General delivery conditions*

EN 10149-2, *Hot rolled flat products made of high yield strength steels for cold forming - Part 2 : Delivery conditions for thermomechanical rolled steels.*

EN 10149-3, *Hot rolled flat products made of high yield strength steels for cold forming - Part 3 : Delivery conditions for normalized/normalized rolled steels.*

EN 10168, *Iron and steel products – Inspection document – Contents*

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

prEN 10249-2, *Cold formed steel sheet piling - Part 2 : Tolerances on shape and dimensions.*

EN ISO 377, *Steel and steel products – Location and preparation of samples and test pieces for mechanical testing.*

EN ISO 14284, *Steel and iron – Sampling and preparation of samples for the determination of chemical composition.*

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 European Standard, the terms and definitions given in EN 10020, EN 10021 and EN 10079 and the following apply.

3.1 cold formed sheet piling

Products made by cold forming on a rolling machine or on a brake press ; the form of the product is such that when interlocking their joints or overlapping the profiles ends, they constitute a continuous sheet piling structure.

4 Information to be supplied by the purchaser

4.1 General

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

- a) details of the product form, length, quantity and any further processing work that is required, e.g. surface treatment,
- b) the designation of the product (in accordance with 6.2),
- c) whether products have to be submitted to inspection and testing and if inspection and testing is required, which type of inspection and which inspection document is required (see 8.1.2).

Where no specific choice is made by the purchaser concerning a) and b), the supplier shall refer back to the purchaser.

NOTE It is recommended that the manufacturer be informed by the purchaser at the time of the order , if the purchaser intends to carry out any surface treatment on the product after delivery.

4.2 Options

A number of options are specified in clause 10. In the event that the purchaser does not indicate a requirement to implement any of these options, the product shall be supplied in accordance with the basic specification.

5 Mass of steel

The calculated mass shall be determined using a conventional volumetric mass of 7,85 kg/dm³.

6 Classification and designation

6.1 Classification

This European Standard considers seven steel grades suitable for cold forming :

- Steel EN10025-2 – S235JRC
- Steel EN10025-2 – S275JRC

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- Steel EN10025-2 – S355J0C
- Steel EN10149-2 – S355MC
- Steel EN10149-3 – S355NC
- Steel EN10149-2 – S420MC
- Steel EN10149-3 – S420NC

6.2 Designation

6.2.1 Steel names ¹⁾ are assigned to steel grades in accordance with EN 10027-1. Steel numbers are allocated to steel grades in accordance with EN 10027-2.

6.2.2 The products covered by this European Standard shall be designated in the following sequence :

- a) the name of the product, i.e. "Sheet piling",
- b) the number of this European Standard, i.e. EN 10249,
- c) the steel name or number.

EXAMPLE : Sheet piling EN 10249-S235JRC or Sheet piling EN 10249-1.0122

indicates a sheet piling in accordance with EN 10249 made of steel S235JRC (Steel number 1.0122).

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7 Technical requirements (standards.iteh.ai)**7.1 Steel manufacturing process**

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7.1.1 The steel manufacturing process shall be at the manufacturer's option. Where specified at the time of the enquiry and order, the steel manufacturing process shall be reported to the purchaser.

Option 1 See 10.2

7.1.2 The method of deoxidation shall be at the discretion of the manufacturer, except that rimming steel shall not be permitted.

7.2 Delivery conditions

Unless otherwise agreed, sheet piles shall be delivered in the as cold formed condition.

Option 2 : See 10.3**7.3 Chemical composition**

The chemical compositions for both the ladle and the product analyses shall comply with the values given in Tables 1 and 2 in conformity with EN 10025-2, EN 10149-2 and EN 10149-3.

¹⁾ Former national designations (steel names) are listed in annex B

7.4 Mechanical properties

In the delivery condition as specified in 7.2, the mechanical properties shall comply with Table 3 in conformity with the relevant requirements of EN 10025-2, EN 10149-2 and EN 10149-3 respectively. The test specimen shall be taken from the source material or from the cold-formed sheet piling.

7.5 Technological properties

7.5.1 Weldability

In general, steels for cold formed sheet pile are suitable for arc welding. General requirements for welding of the grades listed in 6.1 are given in EN 1011- 2. .

7.5.2 Durability

Durability is dependent on the chemical composition of steel.

NOTE Steels specified in this European Standard can be used in general, structural and civil engineering works without any specific corrosion protection. In this case, the durability of the sheet-piling wall can be ensured by a sacrificial thickness for corrosion allowance. The corrosion rates to be accounted for in order to calculate the sacrificial thickness depend on the environment where sheet-piling are exposed and on the service life of the sheet-piling structure. The sacrificial thickness for corrosion allowance shall be determined according to the corrosion rates defined in Eurocode EN 1993-5. The durability of steel sheet-piling can also be enhanced by suitable corrosion protections like organic coatings, metallic coatings, or cathodic protection.

7.5.2.1 Suitability for hot-dip zinc coating

Where specified at the time of the enquiry and order, the suitability and the relevant product quality requirements for hot dip zinc coating may be agreed.

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Option 3 : See 10.4

7.6 Load bearing capacity

7.6.1 General

The design of steel sheet-piling structures requires on one hand determination of the actions on the structure, for instance the earth pressure, the water pressure, the surface surcharge, etc..., and on the other hand determination of the appropriate resistances. The actions will give rise to effects all over the structure, for instance internal forces and moments, stresses, strains and displacements. Additional local effects will also be produced for instance at points of load applications. The resistances of the sheet-piling to the effects of the loads shall be determined according to the calculation methods defined in Eurocode EN 1993-5.

7.6.2 Section resistance determined according to EN 1993-5

In general, the section resistance can be expressed as the product of the material strength, depending on the steel grade, by a specified geometrical section property, depending on the nominal dimensions of the section. The guidelines for calculating the section properties from the sheet-piling nominal dimensions are given in the normative Annex A.

7.7 Tolerances on dimensions and shape

The tolerances on dimensions and shape defined in prEN 10249-2 shall apply. The manufacturer shall declare the dimensional form of the sheet-piles.

prEN 10249-1:2006 (E)**7.8 Surface condition**

The products shall be sound and free from any surface flaws which might preclude its use for the purpose for which it is intended.

Cutting burrs which may exist at the ends of the sheet piling are acceptable provided that they do not impair the fitness of the profiles to be interlocked and their use.

8 Inspection and testing**8.1 General**

8.1.1 The products shall be delivered either with specific or non-specific inspection and testing to indicate compliance with the order and this European standard.

Option 4 : see 10.5

8.1.2 If specific inspection and testing is requested, then it shall be carried out according to 8.2 to 8.8.

8.1.3 Unless otherwise agreed at the time of the enquiry and order, inspection of surface conditions and dimensions shall be carried out by the manufacturer.

Option 5 : see 10.6**8.2 Specific inspection and testing**

Where specific inspection and testing is specified (see 4.1.c), the following tests shall be made :

- the chemical analysis on the hot rolled coil (see 8.4)
- the tensile test on the hot rolled coil (see 8.5).

At the time of the order, the following additional tests can be agreed:

- the chemical analysis on the cold-formed sheet-piling

Option 6, see 10.7

- the tensile test on the cold-formed sheet-piling

Option 7, see 10.8**8.3 Inspection units**

The inspection unit shall comprise products of the same section and the same steel grade as specified in Table 1, produced from the same cast or sequence of casts of the same steel grade and shall have a maximum mass of 125 tonnes.

8.4 Chemical composition

Except when agreed otherwise at the time of enquiry and order, the chemical analysis shall be carried out on the hot rolled coil material.

Where the product analysis is specified, the preparation of samples shall be in accordance with EN ISO 14284.

The purchaser shall specify the number of samples and the elements to be measured.

Option 6, see 10.7

The chemical analysis shall be carried out using appropriate documents. The choice of a suitable physical or chemical analytical method shall be at the discretion of the manufacturer. The manufacturer shall declare the test method used if required.

NOTE The list of the available documents on chemical analysis is given in CR 10261.

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8.5 Tensile testing

Tensile testing shall be carried out on the hot rolled coil.

When agreed at the time of enquiry and order, the tensile test shall be carried out on the cold-formed sheet-piling.

Option 7, see 10.8**8.5.1 Number of samples**

One sample shall be taken from each inspection unit (see 8.3.).

8.5.2 Position and preparation of test pieces

Samples shall be taken from the hot rolled coil material or the cold formed sheet-piling (see 10.8) and test pieces prepared in accordance with EN ISO 377.

8.5.3 Test pieces

Test pieces shall comply with EN 10002-1.

Proportional test pieces having an initial gauge length $L_0 = 5,65 \sqrt{S_0}$ shall be used, where S_0 is the initial cross sectional area of the test piece.