



SLOVENSKI STANDARD
oSIST prEN 10370:2019
01-julij-2019

Jekla za armiranje betona - Nerjavno jeklo

Steel for the reinforcement of concrete - Stainless steel

Stahl für die Bewehrung von Beton - Nichtrostender Stahl

Aciers pour l'armature du béton - Aciers inoxydables

Ta slovenski standard je istoveten z: prEN 10370

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Steel for the reinforcement of concrete - Stainless steel

Aciers pour l'armature du béton - Aciers inoxydables

Stahl für die Bewehrung von Beton - Nichtrostender
Stahl

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COMITÉ EUROPÉEN DE NORMALISATION
EUROPÄISCHES KOMITEE FÜR NORMUNG

CEN-CENELEC Management Centre: Rue de la Science 23, B-1040 Brussels

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European foreword

This document (prEN 10370:2019) has been prepared by Technical Committee CEN/TC 459/SC 4 “Concrete reinforcing and prestressing steels”, the secretariat of which is held by DIN.

This document is currently submitted to the CEN Enquiry.

This document has been prepared under a standardization request given to CEN by the European Commission and the European Free Trade Association, and supports essential requirements of EU Construction Product Regulation (EU 305/2011).

For relationship with EU Regulation (EU 305/2011), see informative Annex ZA, which is an integral part of this document.

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1 Scope

This document specifies product characteristic, test/assessment method and the way of expressing test results, for stainless steel as defined in EN 10088-1 and designated as in EN 10088-1 for the use of the reinforcement of concrete.

It applies to stainless steel products with ribbed or indented surfaces, which are in the form of:

- bars and coils (rod, wire);
- sheets of factory-made machine-welded fabric;
- lattice girders and hybrid lattice girders composed by stainless steel and by weldable reinforcing steel according to EN 10080.

This document does not apply to:

- pre-stressed stainless steels;
- indented strip;
- stainless steel tube filled with carbon steel swarf, which is then hot or cold reduced;
- stainless steel smooth bar with weld material deposited on it;
- galvanized reinforcing steel;
- epoxy-coated reinforcing steel.

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2 Normative references

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The following documents are referred to in the text in such a way that some or all of their content constitutes requirements 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 10020, *Definition and classification of grades of steel*

EN 10079, *Definition of steel products*

EN 10080, *Steel for the reinforcement of concrete - Weldable reinforcing steel - General*

EN 10088-1:2014, *Stainless steels - Part 1: List of stainless steels*

EN 10088-5, *Stainless steels - Part 5: Technical delivery conditions for bars, rods, wire, sections and bright products of corrosion resisting steels for construction purposes*

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

EN ISO 6892-2, *Metallic materials - Tensile testing - Part 2: Method of test at elevated temperature (ISO 6892-2)*

EN ISO 7500-1, *Metallic materials - Calibration and verification of static uniaxial testing machines - Part 1: Tension/compression testing machines - Calibration and verification of the force-measuring system (ISO 7500-1)*

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EN ISO 15630-1, *Steel for the reinforcement and prestressing of concrete - Test methods - Part 1: Reinforcing bars, rods and wire (ISO 15630-1)*

EN ISO 15630-2, *Steel for the reinforcement and prestressing of concrete - Test methods - Part 2: Welded fabric and lattice girders (ISO 15630-2)*

3 Terms, definitions, symbols, units and abbreviated terms

For the purposes of this document, the terms and definitions given in EN 10020, EN 10079 and the following apply.

- 3.1**
7 % strength
strength at 7 % total elongation, $R_{7,0}$
- 3.2**
angle of inclination of diagonals, ϑ
angle between the axis of a diagonal and the longitudinal axis of a lattice girder in the plane of the diagonal in the middle of the height of a lattice girder
- 3.3**
angle of transverse rib or indentation inclination, β
angle between the axis of the transverse rib and the longitudinal axis of the bar, rod or wire
- 3.4**
batch
quantity of rebars, processed from an identical heat or cast, size or alloy, processed in the same production lot, in the same process conditions or any quantity of welded fabric or lattice girders of one type produced by one manufacturer and presented for examination at any one time
- 3.5**
characteristic value C_v
value of a material or product property having a prescribed probability of not being attained in a hypothetical unlimited test series
- Note 1 to entry: This value generally corresponds to a specific fractile of the assumed statistical distribution of the particular property of the material or product.
- 3.6**
coil
single length of reinforcing steel wound in concentric rings, including coils welded together to produce a single coiled length
- 3.7**
design height of a lattice girder, H_1
distance between the lowest point of the lower chord and the highest point of the upper chord
- 3.8**
design width of a lattice girder, B_1
distance between the outlying points of the lower chords

3.9**hybrid lattice girder**

lattice girder where the metallic structure is composed of both stainless steel used for the reinforcement of concrete and weldable reinforcing steel; for hybrid lattice girders apply the same definitions as for lattice girders, i.e

3.10**indented reinforcing steel**

reinforcing steel with defined indentations uniformly distributed over the entire length

3.11**indentation depth, t**

distance between the surface of the wire and the deepest point of the indentation

3.12**indentation width, b**

width of the indentation to be measured parallel to the axis of the bar, rod or wire

3.13**lattice girder**

two or three-dimensional metallic structure comprising an upper chord, one or more lower chords and continuous or discontinuous diagonals which are welded or mechanically assembled to the chords

3.14**lattice girder length, L_{lg}**

overall length of a lattice girder

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3.15**lattice girder overhang, u_1, u_2**

length of the diagonals beyond either the upper chord (u_1) or the lower chord (u_2)

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3.16**length of a welded fabric sheet, L_{wf}**

dimension of the longest side of a sheet of welded fabric, irrespective of the manufacturing direction

3.17**longitudinal rib**

uniform continuous protrusion parallel to the axis of the bar, rod or wire

3.18**longitudinal wire**

reinforcing steel in the manufacturing direction of the welded fabric

3.19**lower chord**

set of longitudinal reinforcing steels placed in the lower part of a lattice girder

Note 1 to entry: They form harmonic curves in the case of continuous diagonals or are independent elements in the case of discontinuous diagonals.

3.20**minimum value**

value below which no test result shall fall

prEN 10370:2019 (E)**3.21****maximum value**

value which no test result shall exceed

3.22**nominal cross-sectional area, A_n**

cross-sectional area equivalent to the area of a circular plain bar of the same nominal diameter, d_{nom} (i.e.

$$\frac{\pi d_{nom}^2}{4})$$

3.23**overall height of a lattice girder, H_2**

distance between the lowest point and the highest point of a lattice girder

3.24**overall width of a lattice girder, B_2**

distance between the outlying points of a lattice girder

3.25**overhang of welded fabric, u_1, u_2, u_3, u_4**

length of longitudinal or transverse wires projecting beyond the centre of the outer crossing wire in a sheet of welded fabric

iTeh STANDARD PREVIEW**3.26****pitch of diagonals, P_s**

distance between equivalent consecutive junction points of the diagonals with the chords

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3.27**pitch of welded fabric**

centre-to-centre distance of wires in a sheet of welded fabric

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3.28**production lot**

uninterrupted period of production

3.29**purpose made lattice girder**

lattice girder manufactured according to user's specific requirements

3.30**purpose made welded fabric**

welded fabric manufactured according to user's specific requirements

3.31**reinforcing steel**

steel product with a circular or practically circular cross-section which is suitable for the reinforcement of concrete

3.32**relative indentation area f_p**

area of the projection of all indentations on a plane perpendicular to the longitudinal axis of the bar, rod or wire, divided by the indentation spacing and the nominal circumference

3.33**relative rib area, f_R**

area of the projection of all ribs on a plane perpendicular to the longitudinal axis of the bar, rod or wire, divided by the rib spacing and the nominal circumference

3.34**ribbed reinforcing steel**

reinforcing steel with at least two rows of transverse ribs, which are uniformly distributed over the entire length

3.35**rib height, h**

distance from the highest point of the rib (transverse or longitudinal) to the surface of the core, to be measured normal to the axis of the bar, rod or wire

3.36**rib or indentation spacing, c**

distance between the centres of two consecutive transverse ribs measured parallel to the axis of the bar, rod or wire

3.37**semi-finished product**

ribbed or indented product which requires further processing in order to achieve the standard and special properties specified in this document for reinforcing steels

3.38**special property**

property contained in this document which is not determined as part of the factory production control requirements for every test unit

3.39**standard lattice girder**

lattice girder manufactured according to specified delivery conditions and available from stock

3.40**standard property**

property which is contained in this document as part of the factory production control requirements for every test unit

3.41**standard welded fabric**

welded fabric manufactured according to specified delivery conditions and available from stock

3.42**transverse rib**

any rib on the surface of the bar, rod or wire other than a longitudinal rib

3.43**transverse rib flank inclination, α**

angle of the rib flank measured perpendicular to the longitudinal axis of the rib

3.44**transverse wire**

reinforcing steel perpendicular to the manufacturing direction of the welded fabric

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3.45

welded fabric

arrangement of longitudinal and transverse bars, rods or wires of the same or different nominal diameter and length that are arranged substantially at right angles to each other and factory electrical resistance welded together by automatic machines at all points of intersection

3.46

width of a welded fabric sheet, B

dimension of the shortest side of the sheet of welded fabric, irrespective of the manufacturing direction

3.47

bar

product of plain round or ribbed cross-section

For the purposes of this document, the symbols, units and abbreviated terms are listed in Table 1

Note 1 to entry: For comparison of symbols used in this European standard with those used in EN 1992-1-1 and EN 1992-1-2 see Annex F.

Table 1 — Symbols, unit and abbreviated terms

Symbol	Description	Unit
\bar{x}	Average value of test results	a
α	Transverse rib flank inclination	°
ϑ	Inclination of the diagonals in lattice girder or in hybrid lattice girder	°
$a1, a2, a3, a4$	Increment (specified in the product specification)	a
A_{Ch}	Cross-sectional area of chord	mm ²
A_{Di}	Cross-sectional area of diagonal	mm ²
A_{gt}	Percentage total elongation at maximum force	%
A_n	Nominal cross-sectional area	mm ²
b	Width of indentation	mm
B	Length of transverse wire in welded fabric	mm
B_1	Design width of lattice girder or hybrid lattice girder	mm
B_2	Overall width of lattice girder or hybrid lattice girder	mm
c	Transverse rib or indentation spacing	mm
C_v	Specified characteristic value	
d_{nom}	Nominal diameter of the reinforcing steel	mm
d_c	Diameter of transverse wires in welded fabric	mm
d_L	Diameter of longitudinal wires in welded fabric	mm
e	Gap between rib or indentation rows	mm
E	Young's modulus	MPa ^b
F_d	Shear force of a clamped joint in lattice girder or hybrid lattice girder	kN

Symbol	Description	Unit
f_P	Relative indentation area	-
f_R	Relative rib area	-
F_w	Shear force of a single weld in lattice girder or hybrid lattice girder	kN
h	Rib height	mm
H_1	Design height of lattice girder or hybrid lattice girder	mm
H_2	Overall height of lattice girder or hybrid lattice girder	mm
k	Coefficient as a function of the number of test results	-
L_{lg}	Length of lattice girder or hybrid lattice girder	mm
L_{wf}	Length of longitudinal wire in welded fabric	mm
N_c	Number of transverse wires in welded fabric	-
N_L	Number of longitudinal wires in welded fabric	-
P_c	Pitch of transverse wires in welded fabric	mm
P_L	Pitch of longitudinal wires in welded fabric	mm
P_S	Pitch of diagonals of lattice girder or hybrid lattice girder	mm
$R_{7.0}$	strength at 7 % total elongation	MPa ^b
R_m	Tensile strength	MPa ^b
$R_m/R_{p0,2}$	Ratio tensile strength/0,2 % proof strength	-
$R_{p0,2}$	0,2 % proof strength (tensile yield strength)	MPa ^b
$R_{p0,2act}$	Actual value of 0,2 % proof strength	MPa
$R_{p0,2act}/R_{p0,2nom}$	Ratio actual value of 0,2 % proof strength/specified value of 0,2 % proof strength	-
$R_{p0,2Ch}$	0,2 % proof strength of the chord in lattice girder or in hybrid lattice girder	MPa ^b
$R_{p0,2Di}$	0,2 % proof strength of the diagonal in lattice girder or in hybrid lattice girder	MPa ^b
$R_{p0,2nom}$	Specified value of 0,2 % proof strength	MPa
s	Estimate of the standard deviation	a
β	Angle of transverse rib or indentation inclination	°
t	Depth of indentation	mm
u_1, u_2	Overhang of the longitudinal wires in welded fabric or length of the diagonals beyond the upper or lower chord of a lattice girder or hybrid lattice girder	mm
u_3, u_4	Overhang of the transverse wires in welded fabric	mm
a	The unit depends on the property.	
b	1 MPa = 1 N/mm ² .	