INTERNATIONAL STANDARD

ISO 15835-2

Second edition
2018-10

Steels for the reinforcement of concrete — Reinforcement couplers for mechanical splices of bars —

Part 2: Test methods

Aciers pour l'armature du béton — Coupleurs d'armature destinés aux raboutages mécaniques de barres —

Partie 2: Méthodes d'essai

Reference number
ISO 15835-2:2018(E)

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Published in Switzerland

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Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular, the different approval criteria needed for the different types of ISO documents should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2 (see www.iso.org/directives).

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights. Details of any patent rights identified during the development of the document will be in the Introduction and/or on the ISO list of patent declarations received (see www.iso.org/patents).

Any trade name used in this document is information given for the convenience of users and does not constitute an endorsement.

For an explanation of the voluntary nature of standards, the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the World Trade Organization (WTO) principles in the Technical Barriers to Trade (TBT) see www.iso.org/iso/foreword.html.

The committee responsible for this document is ISO/TC 17, *Steel*, Subcommittee SC 16, *Steels for the reinforcement and prestressing of concrete*.

This second edition cancels and replaces the first edition (ISO 15835-2:2009), which has been technically revised with changes made to Clauses 5 and 6, 5.2, 5.4 and 5.6 and Table 1. The figures have been revised and renumbered.

A list of all the parts in the ISO 15835 series can be found on the ISO website.

Any feedback or questions on this document should be directed to the user's national standards body. A complete listing of these bodies can be found at www.iso.org/members.html.

Steels for the reinforcement of concrete — Reinforcement couplers for mechanical splices of bars —

Part 2: Test methods

1 Scope

This document specifies test methods applicable to couplers for mechanical splices of steel reinforcing bars.

This document is applicable to the various standards for steel reinforcing bars as well as the various reinforced concrete design standards.

2 Normative references

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.

ISO 6892-1:2016, *Metallic materials — Tensile testing — Part 1: Method of test at room temperature*

ISO 9513, *Metallic materials — Calibration of extensometer systems used in uniaxial testing*

ISO 15630-1, *Steel for the reinforcement and prestressing of concrete — Test methods — Part 1: Reinforcing bars, wire rod and wire*

ISO 15835-1, *Steels for the reinforcement of concrete — Reinforcement couplers for mechanical splices of bars — Part 1: Requirements*

ISO 16020, *Steel for the reinforcement and prestressing of concrete — Vocabulary*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO 15835-1 and ISO 16020 apply.

ISO and IEC maintain terminological databases for use in standardization at the following addresses:

— ISO Online browsing platform: available at https://www.iso.org/obp

— IEC Electropedia: available at http://www.electropedia.org/

4 Symbols

Table 1 — Symbols

Symbol	Unit	Designation
A_{gt}	%	Percentage total elongation at maximum tensile force, F_{max}
d	mm	Nominal diameter of the reinforcing bar
E	MPa[a]	Nominal modulus of elasticity of the reinforcing bar
[a] 1 MPa = 1 N/mm^2.		

Table 1 *(continued)*

Symbol	Unit	Designation
L	mm	Length of mechanical splice as defined in ISO 15835-1
L_1	mm	Coupler length
L_g	mm	Gauge length for the measurement of slip
L_0	mm	Gauge length for conducting the low-cycle loading test
N	—	Specified number of load cycles in high-cycle fatigue test
$R_{eH,\,spec}$	MPa	Specified characteristic (or nominal) yield strength value of the reinforcing bar
ΔL_e	mm	Calculated elastic elongation of an unspliced bar
ΔL_g	mm	Total elongation of the spliced bar measured as elongation of the gauge length
ΔL_s	mm	Slip of the mechanical splice
ΔL_t	mm	Gauge length extension under load
ε_y	%	Strain at nominal yield strength
$2\sigma_a$	MPa	Stress range for high-cycle fatigue test
σ_{max}	MPa	Upper stress in the axial load fatigue test
σ_{min}	MPa	Lower stress in the axial load fatigue test

[a] 1 MPa = 1 N/mm^2.

5 Testing of mechanical splices

5.1 General

The test methods covered by this document are as follows:

a) tensile test (see 5.3);

b) slip test (see 5.4);

c) high-cycle fatigue test (see 5.5);

d) low-cycle loading test (see 5.6).

A reference bar shall always be tested in the case of qualification testing and continuous independent testing, for each test except the fatigue test. The reference bar shall be taken from the same length of reinforcing bar as used in the test splice. Where different diameters are used in a splice, the reference bar shall be taken from the smaller bar diameter of the splice.

For the calculation of stresses, the nominal cross-sectional area of the reinforcing bar shall be used.

For couplers with adjustable length, splices should be tested at their maximum extension in accordance with the manufacturer's instructions.

The temperature in the testing laboratory should be between 10 °C and 30 °C.

5.2 Preparation of test pieces

All tests shall be performed on mechanical splices prepared and assembled in the same manner as they are prepared for normal use, according to written installation instructions from the supplier of the coupler. The installation instruction documents for the coupler shall be made available to the testing laboratory.

The coupler shall be positioned approximately in the middle of the test piece.