MAURITIAN STANDARD

MS 10:2015

(BS 4449:2005 + A2:2009)

Third edition
2015-04-11

Steel for the reinforcement of concrete — Weldable reinforcing steel - Bar, coil and decoiled product - Specification

PREVIEW

ICS 77.140.15; 91.080.40

Mauritius Standards Bureau
Moka

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National foreword

MS 10:2015 was drawn up by the Mauritius Standards Bureau on the recommendation of the **Building and Construction Standards Committee** and approved by the **Standards Council** on 5 March 2015. It was notified in the Government Gazette on **11 April 2015***.

This Mauritian Standard is an adoption of the British Standard **BS 4449:2005 +A2:2009**, and was implemented with the permission of the British Standards Publishing Ltd.

This new edition cancels and replaces MS 10:1999 which is withdrawn. This edition incorporates a full revision of the standard and the main changes are as follows:

(i) The characteristic yield strength has been increased to 500 MPa.

(ii) A third ductility class has been added compared to MS 10:1999.

(iii) This standard no longer covers plain round bar. For sizes up to and including 12 mm in coil, plain round wire of grade 250 MPa has been incorporated into MS 34:2015.

For the purposes of this standard the following editorial changes should be made:

(i) the words 'British Standard' should be replaced by 'Mauritian Standard';

(ii) the values of the tensile/yield strength ratio, R_m/R_e given in Table 4 should be minimum;

(iii) the values of the total elongation at maximum force, A_{gt} given in Table 4 should be minimum

For the purpose of this standard the following Technical deviation is made

Subclause	**Modification**
7.2.4 Fatigue strength	Replace the paragraph by the following:
7.2.4.1 ***General***	"Reinforcing bars, coils and decoiled products, ***If required by the purchaser***, shall be subjected to fatigue testing. When submitted to axial force controlled fatigue testing, using a stress ratio (δ_{min}/ δ_{max}) of 0.2, and stress range as given in Table 5, test samples shall survive five million stress cycles. "

Explanation: The fatigue test will be applicable only to steel bars used in structures subject to variable stress (eg bridges) and/or if required by the purchaser.

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PREVIEW

Contents

		Page
Committees responsible		Inside front cover
Foreword		ii
1	Scope	1
2	Normative references	1
3	Terms and definitions	1
4	Symbols	3
5	Designations	3
6	Steelmaking and manufacturing processes	3
7	Product characteristics	5
8	Evaluation of conformity	10
9	Test methods	13
10	Identification	13
11	Verification of properties in the case of dispute	15
Annex A (normative) Bond test for ribbed reinforcing steel — Beam test		16
Annex B (normative) Material not covered by a third party product certification scheme		23
Annex C (normative) Identification requirements		25
Bibliography		27
Figure 1 — Rib geometry example with two rows of transverse ribs		9
Figure 2 — Example of rib pattern for grade B500A		14
Figure 3 — Example of rib pattern for grade B500B		14
Figure 4 — Example of rib pattern for grade B500C		14
Figure A.1 — Dimensions of the hinge for beam type A (d < 16 mm)		16
Figure A.2 — Dimensions of the hinge for beam type B ($d \geqslant$ 16 mm)		17
Figure A.3 — Beam test type A (d < 16 mm)		17
Figure A.4 — Beam test type B ($d \geqslant$ 16 mm)		18
Figure A.5 — Bond test type A (d < 16 mm) — Reinforcement of beam specimens		20
Figure A.6 — Bond test type B ($d \geqslant$ 16 mm) — Reinforcement of beam specimens		21
Figure C.1 — Example of manufacturer's identification mark (using widened ribs)		25
Table 1 — List of symbols		4
Table 2 — Chemical composition (maximum % by mass)		5
Table 3 — Conditions of testing the mechanical properties		5
Table 4 — Characteristic tensile properties		6
Table 5 — Fatigue test conditions		6
Table 6 — Mandrel diameters for rebend test		7
Table 7 — Nominal cross-sectional area and mass per metre		8
Table 8 — Ranges for the rib parameters		9
Table 9 — Characteristic relative rib area		9
Table 10 — Absolute minimum and maximum values of tensile properties		11
Table 11 — Coefficient k as a function of the number n of test results (for a reliable failure rate of 5 % [p = 0.95] at a probability of 90 %)		12
Table 12 — Coefficient k as a function of the number n of test results (for a reliable failure rate of 10 % [p = 0.90] at a probability of 90 %)		13
Table A.1 — Series of reinforcing steel diameters for testing of bond		18
Table C.1 — Identification of the country of origin		26

PREVIEW

Foreword

This British Standard has been prepared by Subcommittee ISE/9/1. BS 4449:2005 +A2:2009 supersedes BS 4449:2005+A1:2007, which is withdrawn. This edition incorporates a full revision of the standard. The characteristic yield strength has been increased to 500 MPa, and a third ductility class has been added, compared to BS 4449:1997.

The start and finish of text introduced by Amendment No. 1 and No. 2 is indicated in the text by tags ▶A1⟨ ⟨A1▶ and ▶A2⟨ ⟨A2▶.

This standard no longer covers plain round bar. For sizes up to and including 12 mm in coil, plain round wire of grade 250 MPa has been incorporated into BS 4482. For larger sizes, for dowel bar applications, reference should be made to BS EN 10025-1. For dowel bars for use in concrete pavements, reference should be made to BS EN 13877-3.

This standard has been written so that it can be used in conjunction with BS EN 10080:2005. Definitions, symbols, steelmaking and manufacturing processes, routine inspection and testing, test methods, identification of the manufacturer and technical class and verification of mechanical properties in the case of dispute are all taken from BS EN 10080:2005.

BS EN 10080:2005 does not define steel grades or technical classes, and requires that technical classes should be defined in accordance with BS EN 10080:2005, by specified values of R_e, R_m/R_e, A_{gt}, $R_{e,act}/R_{e,nom}$ (where appropriate), fatigue strength, bend performance, weldability, bond strength, tolerances and dimensions. The three steel grades in this standard conform to all of the requirements of BS EN 10080:2005.

The three grades in this standard also conform to the three recommended ductility classes of BS EN 1992-1-1:2004, although the fatigue requirements and the fatigue test conditions are retained from the previous version of this standard. The only exception to this is for grade B500A in sizes below 8 mm, where the ductility requirements specified are below those of BS EN 1992-1-1:2004.

▶A1⟨ In the previous revision of this standard, bond was specified by means of a projected rib area, with a pull-out test specified as an alternative means of demonstrating compliance with the bond requirements of BS 8110-1. In this revision, bond is specified by means of a relative rib area. As an alternative, a beam test is provided in Annex A, which may be used to demonstrate compliance with Eurocode 2. Where an alternative bond test is required to demonstrate compliance with BS 8110-1, then the pull-out test may be used. This pull-out test alternative may only be applied to steels of grade B500A. ⟨A1▶

BS EN 10080:2005 contains an informative Annex ZA, which describes how that standard can be used for the purposes of CE marking of reinforcing steels. Annex ZA and **8.2**, **8.3** and **8.4** of BS EN 10080:2005 relate to the role of the notified body in assessing products for an EC certificate of conformity, and as such are not included in this standard. It is not a requirement of this British Standard that materials produced to it should meet the requirements for CE marking.

Where CE marking is required for the purposes of complying with the EU Construction Products Directive, BS EN 10080:2005 applies.

It is recommended that purchasers specify reinforcing steel that has been manufactured and supplied to a recognized third party product certification scheme. **8.2** specifies the determination of the long term quality level under such a scheme. As an alternative, Annex B provides a batch testing method for material which has not been produced under such a scheme.

In BS EN 10080, the terms “rod” and “wire” are used to describe reinforcing steel in coil. In this standard, these terms have not been included to avoid the potential for confusion, particularly with wire produced to BS 4482.

This standard comes into effect on 1 January 2006.

PREVIEW

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Summary of pages

This document comprises a front cover, an inside front cover, pages i to iii, a blank page, pages 1 to 27 and a back cover.

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PREVIEW

PREVIEW

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1 Scope

This British Standard specifies requirements for ribbed weldable reinforcing steel used for the reinforcement of concrete structures. The standard covers steel delivered in the form of bars, coils and decoiled products. The standard contains provisions for three steel grades, all of 500 MPa characteristic yield strength, but with different ductility characteristics. The three grades are B500A, B500B and B500C.

The weldability requirements for all grades of steel are specified in terms of the chemical composition, and in particular the carbon equivalent value.

Steel bars produced by re-rolling finished products, or by rolling material of which the metallurgical history is not fully documented or not known, are not covered by this British Standard.

NOTE Flash welds in lengths of bar are permissible under this standard, provided all the mechanical requirements are met. However, for some purposes, purchasers might specifically require bars without flash welds, and if so this ought to be stated at the time of enquiry and/or order.

2 Normative references

The following referenced documents are indispensable for the application 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.

BS EN 1766:2000, *Products and systems for the protection and repair of concrete structures — Test methods — Reference concretes for testing.*

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

BS EN 10025-1, *Hot rolled products of structural steels — General technical delivery conditions.*

BS EN 10079, *Definition of steel products.*

BS EN 10080:2005, *Steel for the reinforcement of concrete — Weldable reinforcing steel — General.*

BS EN 12390-3, *Testing hardened concrete — Part 3: Compressive strength of test specimens.*

BS EN ISO 15630-1:2002, *Steel for the reinforcement and prestressing of concrete — Test methods — Part 1: Reinforcing bars, wire rod and wires.*

3 Terms and definitions

For the purposes of this British Standard the definitions in BS EN 10020 and BS EN 10079 apply, in addition to the following definitions taken from BS EN 10080:2005.

3.1
reinforcing steel
steel product with a circular or practically circular cross-section which is suitable for the reinforcement of concrete

NOTE The reinforcing steels specified using this standard are bar, coil and decoiled product.

3.2
ribbed reinforcing steel
reinforcing steel with at least two rows of transverse ribs, which are uniformly distributed over the entire length

3.3
longitudinal rib
uniform continuous protrusion parallel to the axis of the reinforcing steel

3.4
transverse rib
rib on the surface of the reinforcing steel other than a longitudinal rib

PREVIEW