



**BRUNEI DARUSSALAM STANDARD  
PIAWAI BRUNEI DARUSSALAM**

**PBD 3 : 2016  
(Second Edition)**

**SPECIFICATION FOR STEEL RIBBED BARS FOR THE  
REINFORCEMENT OF CONCRETE**

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**NATIONAL STANDARDS COUNCIL  
BRUNEI DARUSSALAM**

Published by  
National Standards Centre

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The Brunei Darussalam Standards are subject to periodical review according to the current needs of the local industries and to keep abreast of progress in the industries concerned. Suggestions of amendments will be recorded and in due course brought to the notice of the committees concerned.

## **Brief Intro on National Standards Council**

Formed in 2009, the Council is envisioned to act as the body responsible for strengthening and monitoring standards and conformance in Brunei Darussalam. Its members encompass multiple agencies across the Government, industry and consumer interests and are envisaged to provide policy direction that will firm up national initiatives to create and stimulate sustainable economic growth. In this endeavor, factors such as the creation and promotion of awareness on consumer safety and interests will also form part of the main scope of the council.

The work of the council is facilitated by the National Standards Centre (NSC), under the Ministry of Finance and Economy. With the main role of strengthening the capacity and sustainability of the national standards infrastructure, the NSC has been instructed to act as a body that provides a platform to complement the formation of the Council.

On matters pertaining to the development of national standards i.e. Piawai Brunei Darussalam (PBD), the management of activities are monitored through the formation of National Standards Committees. Clustered based on the scope of its industry, the work of developing PBD stands guided by international practice with the involvement of multiple agencies across the Government, industry and public as a whole.

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## Amendments issued since publication

Amd No	Date of issue	Text affected
1	29/04/2021	Page iv, 20, 21 & 23 All Table 10 references in PBD 3:2016 will be deleted/replaced to Table 9
2	29/04/2021	Page 7 - Table 3:Note 4 "B" – Steel for Reinforcing Concrete "Next 3 Digits" – Value of minimum upper yield strength "5 <sup>th</sup> Symbol" – Ductility Class (2.2.5) "W" – Intended for welding "R" – Ribbed bar
3	29/04/2021	Page 7 – Table 3:Note 3 Read, "For diameters larger than 32mm, the maximum carbon content (C) is 0.25% and the maximum carbon equivalent (CEV) is 0.55% applicable to B500AWR, B500BWR and B500CWR"
4	29/04/2021	Page 8 – Table 4 : Details on two elements were missing from table. (Silicon & Manganese)
5	29/04/2021	Page 13 – Table 6 Is to be replace with the attached Table 6. Please refer to the attached Table 6.
6	29/04/2021	The entire Appendix – Section B.2.2 "Determination of the long term quality level" in PBD3:2016 shall be replaced with Section 12.2 "Evaluation of conformity during production in ISO 6935-2:2015" Please refer attachment Correction Section 12.2

**COMMITTEE REPRESENTATION**

The Technical Committee on Iron and Steel was entrusted by the Ministry of Development for the preparation of this Brunei Darussalam Standard. The members of the Technical Committee are as follows:-

**Chair:**

Organisation	Name
INMEC Consortium Sdn Bhd	Awang Michael Khoo

**Co-Chair:**

Organisation	Name
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**Secretariat:**

Organisation	Name
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## FOREWORD

This 2<sup>nd</sup> edition of Brunei Darussalam Standard, (Piawaiian Brunei Darussalam) PBD 3:2016 was prepared by Technical Committee on Iron and Steel.

This standard is an adaptation of International Organization for Standardization (ISO 6935-2:2007 and ISO 6935-3:1992).

This Standard has been written so that it can be used in conjunction with the following other related ISO Standards or their latest editions:

- 1) ISO 404: 2013            Steel and steel products - General technical delivery requirements.
- 2) ISO/TS 4949:2003      Steel names based on letter symbols.
- 3) ISO/TR 9769:1991      Steel and Iron - Review of available methods of analysis.
- 4) ISO 10144:1991        Certification scheme for steel bars and wires for the reinforcement of concrete structures
- 5) ISO 14284:1996        Steel and iron - Sampling and preparation of samples for the determination of chemical composition.
- 6) ISO 15630-1:2010      Steel for the reinforcement and pre-stressing of concrete – Test methods - Part 1: Reinforcing bars, wire rods and wires.
- 7) ISO 6892-1:2009        Metallic materials — Tensile testing — Part 1: Method of test at room temperature.
- 8) ISO 6892-2:2011        Metallic materials — Tensile testing — Part 2: Method of test at elevated temperature.
- 9) ISO 4545-1:2005        Test method Metallic Materials – Knoop hardness test Part 1
- 10) ISO 9513:2012         Metallic materials – calibration of extensometer system used in uniaxial testing
- 11) ISO 16020:2005        Steel for the reinforcement and pre-stressing of concrete

All the four grades of steel with specified characteristic value of yield strength of 500 MPa selected in this PBD standard should conform to all the requirements of ISO 6935-2:2007. The commonly available grade used in Brunei Darussalam is B500BWR (which is similar to British Standard Grade B500B).

Some of the tables and references stated in this PBD 3:2015 are reproduced from the above mentioned related ISO standards with copyright permission from ISO.

Acknowledgement is made to the ISO for the use of some of the materials extracted from the above mentioned standards for this publication.

***Disclaimer:***

- 1.) Brunei Darussalam Standards are subject to periodic review with references to technological changes and new developments. Any changes made hereafter are documented through the issue of either amendments or revisions.*
- 2.) Compliance with this Brunei Darussalam Standard does not exempt users from legal obligations or purport to include all the necessary provisions of a contract.*
- 3.) This PBD 3: 2015 does not purport to include all the necessary provisions of a contract.*

## Specification

### 1 Scope

This Brunei Darussalam Standard specifies requirements for weldable steel ribbed bars for the reinforcement of concrete. It covers steel ribbed bars with characteristic yield strength of 500 MPa, with four different ductility classes. The ductility classes are B500AWR, B500BWR, B500CWR and B500DWR.

The weldability requirements for all grades of steel are specified in terms of the carbon equivalent value.

Appendix B covers testing methods for both materials covered and / or not covered by a third party product certification scheme.

This part of PBD 3 covers products delivered in straight lengths.

Steel bars for use as lifting hooks are not included in this standard.

Steel bars produced by re-rolling finished products or by rolling material whose metallurgical history is not known and/or fully documented are excluded from this standard.

NOTE. All steels complying with this Brunei Darussalam Standard are of weldable quality. Welding procedures and consumable appropriate to the particular grade and quality shall be strictly adhered to.