



Expert commentary

BS EN ISO 3506-1:2020 — *Fasteners – Mechanical properties of corrosion resistant stainless steel fasteners – Part 1: Bolts, screws and studs with specified property classes and BS EN ISO 3506-2:2020 Fasteners – Mechanical properties of corrosion resistant stainless steel fasteners – Part 2: nuts with specified property classes*

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1 Overview

In 2010 it was proposed that BS EN ISO 3506-1 and BS EN ISO 3506-2 should be expanded to enable users to have templates for comparison with similar standards for fasteners and associated products manufactured from other materials. The wider use of other grades of high corrosion resistant stainless steels, not currently included was also a major consideration.

The 2009 versions of these standards have been substantially revised technically and the structures and contents brought into line with BS EN ISO 898-1:2013, *Mechanical properties of fasteners made of carbon steel and alloy steel*. Bolts, screws and studs with specified property classes. Coarse thread and fine pitch thread and BS EN ISO 898-2, *Mechanical properties of fasteners made of carbon steel and alloy steel – nuts with specified property classes. Coarse thread and fine pitch thread*. These improvements, together with the addition of a wider range of stainless steel grades, enables the test laboratory, manufacturer, distributor and end user to more reliably ensure that bolts, screws and studs and nuts meet specified standards of performance and resistance to corrosive attack. Bolts, screws and studs and nuts conforming to the requirements of these standards could find applications in many industries including:

- construction;
- civil engineering;
- marine;
- oil;
- nuclear; and
- aircraft and vehicle manufacture.

Users of the 2009 version of these standards will find these revised documents required reading as the significance and scope of the numerous changes and additions provide much improved guidance on the specification and use of these important components.

1.1 Reasons for change

There are a number of reasons why significant revision of these standards was considered to be essential. The expanded use of other types and grades of stainless steels, particularly duplex (austenitic-ferritic) and the need to include bolts, screws and studs and nuts with higher performance requirement were the initial motivation. The working group carrying out the revision identified that BS EN ISO 3506-1 and BS EN ISO 3506-2 should follow the content and format of other bolt, screw and stud and nut standards, particularly BS EN ISO 898-1:2013 and BS EN ISO 898-2: 2012, to ensure that comparison with products manufactured from other materials can be made using the same basic criteria. The main changes and additions are included in the following summary.

1.2 Summary

- Duplex (austenitic-ferritic) and high corrosion resistant austenitic stainless steels have been added.
- Property class 100, similar in performance to carbon steel grade 10.9 has been added.
- Annexes common to all current parts of BS EN ISO 3506 series have been withdrawn from this standard and are now included in a new document – BS EN ISO 3506-6, *Fasteners – Mechanical properties of corrosion resistant stainless steel fasteners – Part 6: Guidance for the selection of stainless steels and nickel alloys for fasteners*.
- A complete revision and amendment of test procedures has been carried out which now also includes procedures relating to bolts, screws and studs and nuts with reduced loadability.
- The structure of the documents has been amended to mirror BS EN ISO 898-1 and BS EN ISO 898-2 where appropriate.

2 Main commentary

BS EN ISO 3506-1 and BS EN ISO 3506-2 still include bolts, screws and studs and nuts manufactured from martensitic and ferritic grades of stainless steels. Expanded performance data and more clearly defined testing procedures for these materials has been added.

The standards now cover a much wider and more comprehensive range of requirements. They therefore provide a sound structure against which the classification of bolts, screws and studs and nuts by mechanical performance and material specification can be reliably made. To facilitate this the product designation and marking and labelling of products have been upgraded and expanded to provide reliable identification of a product. Bolts, screws and studs and nuts manufactured from duplex (austenitic-ferritic) stainless steels will be identified using the prefix letter D.

Prior to this revision, information relating to bolts, screws and studs and nuts with reduced loadability was not available in the standards. Reduced loadability in a fastener is normally due to its geometry, which will mean that it does not meet the