

AD 515: **Welding of structural nuts and bolts**

SCI's Advisory Desk has recently received queries from designers asking if it permissible to weld structural nuts and bolts - typically for situations where there is no access to one side of a connection.

The high temperatures reached during welding will affect the material properties of the nut or bolt and can cause the nut or bolt to become distorted, therefore welding fasteners is generally not permitted. Clause 8.2.1 of BS EN 1090-2 specifies that bolts and nuts shall not be welded, unless otherwise specified, however it is difficult to think of circumstances where welding

fasteners would be appropriate.

Mechanical properties of structural fasteners made from carbon steel and alloy steel are given in BS EN ISO 898-1. Annex B of the standard explains that elevated temperatures can cause changes in the mechanical properties and in the functional performance of a fastener.

The Corrigenda to the 7th edition of the National Structural Steelwork Specification for Building Construction (NSSS), published on 3rd April 2023 and which came into force on 2nd October 2023, makes the use of the *Model specification for the purchase of structural bolting assemblies and holding*

down bolts mandatory, which in turn states that bolting assemblies shall not be welded.

In situations where access is not possible, various solutions are available which do not involve welding the fastener. Cages which are welded to the plate, constraining the nut, are one solution. Various types of expanding anchors and gravity operated toggle bolts are available for one-sided ("blind") fixing applications.

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New and revised codes and standards

From BSI Updates September 2023

BS EN PUBLICATIONS

BS EN 12152:2023

Curtain walling. Air permeability. Performance requirements and classification
supersedes BS EN 12152:2002

BS EN 12153:2023

Curtain walling. Air permeability. Test method
supersedes BS EN 12153:2000

BS EN 17680:2023

Sustainability of construction works. Evaluation of the potential for sustainable refurbishment of buildings
no current standard is superseded

BS EN ISO 52000-1:2017

Energy performance of buildings. Overarching EPB assessment. General framework and procedures
supersedes BS EN 15603:2008, BS ISO 16346:2013 and PD ISO/TR 16344:2012

NEW WORK STARTED

EN WI 00250289

Eurocode. Basis of structural and geotechnical design. Assessment of existing structures
will supersede None

EN 1990

Basis of structural and geotechnical design. New structures
will supersede None

EN 1991-3

Actions on structures. Actions induced by cranes and machinery
will supersede None

EN ISO 8501-1

Preparation of steel substrates before application of paints and related products. Visual assessment of surface cleanliness. Rust grades and preparation grades of uncoated steel substrates and of steel substrates after overall removal of previous coatings
will supersede BS EN ISO 8501-1:2007

EN 15978

Sustainability of construction works. Assessment of environmental performance of buildings. Methodology
will supersede None

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