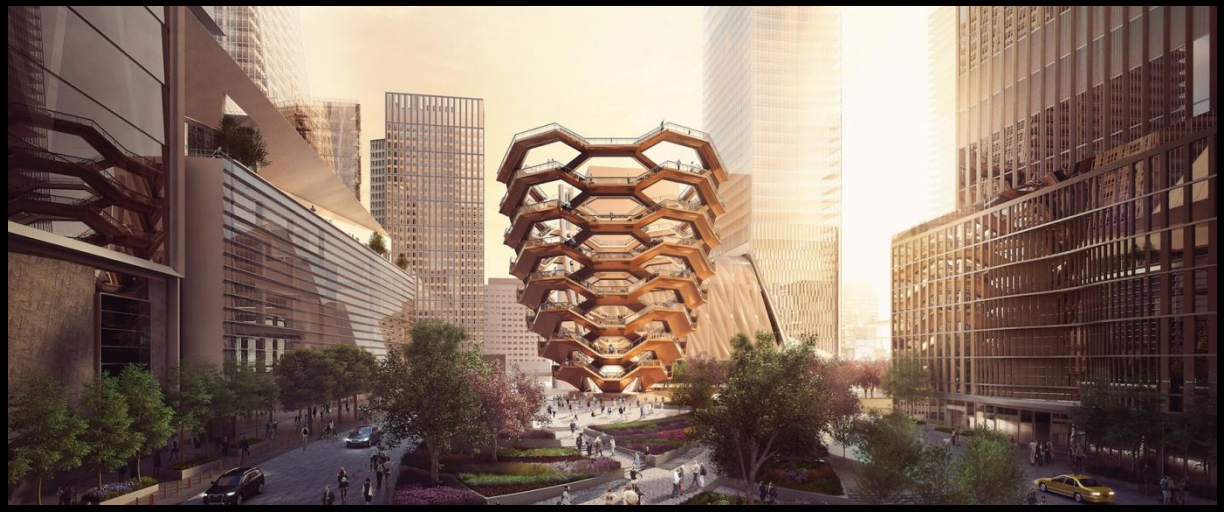

STRUCTURAL BOLTING ASSEMBLIES

EN 14399/ EN 15048
REFERENCE STANDARD

STRUCTURAL BOLTING ASSEMBLIES

Reference standard

- **EN 1993-1-8:2005/AC:2009 (currently under revision)**

  Eurocode 3 – Design of steel structures – Part 1-8: Design of joints
- **EN 1090-2:2008+A1:2011 (new document under approval)**

  Execution of steel structures and aluminium structures - Part 2: Technical requirements for steel structures
- **EN 14399-1:2015**

  High-strength structural bolting assemblies for preloading - Part 1: General requirements
- **EN 15048-1:2016**

  Non-preloaded structural bolting assemblies - Part 1: General requirements

STRUCTURAL BOLTING ASSEMBLIES

Reference standard

Background of the Eurocode programme

In 1975 the European Community Commission decided to draw up an action programme in the construction field, based on article 95 of the Treaty. Within this action programme, the Commission took the initiative to establish a set of harmonized technical rules for the design of the construction works.

The Structural Eurocode programme comprises the following standards, divided into a number of parts:

EN 1990	Eurocode 0	Basis of Structural Design
EN 1991	Eurocode 1	Actions on structures
EN 1992	Eurocode 2	Design of concrete structures
EN 1993	**Eurocode 3**	**Design of steel structures**
EN 1994	Eurocode 4	Design of composite steel and concrete structures
EN 1995	Eurocode 5	Design of timber structures
EN 1996	Eurocode 6	Design of masonry structures
EN 1997	Eurocode 7	Geotechnical design
EN 1998	Eurocode 8	Design of structures for earthquake resistance
EN 1999	Eurocode 9	Design of aluminum structures

STRUCTURAL BOLTING ASSEMBLIES

EN 1993: Design of steel structures

Reference standard

EN 1993 Eurocode 3 applies to the design of buildings and other civil engineering steel works. It complies with the principles and requirements for the safety and serviceability of the structures, the basis of their design and verification that are given in EN 1990 – Basis of structural design. EN Eurocode 3 is concerned with the requirements for resistance, serviceability, durability and fire resistance of the steel structures.

EN Eurocode 3 is wider in scope than most of the other EN Eurocodes designs, due to the diversity of the steel structures, the need to cover both bolted and welded joints and the possible slenderness of the construction. EN 1993 includes almost 20 parts covering common rules, fire design, bridges, buildings, tanks, silos, pipelined piling, crane supported structures, towers and masts, chimneys, etc.

EN Eurocode 3 is intended to be used in conjunction with:

EN 1990: Eurocode 0 - Basis of structural design;

EN 1991: Eurocode 1 - Actions on structures;

EN 1992 to EN 1999 when steel structures or steel components are referred to;

ENs, ETAGs and **ETAs** for construction products relevant for steel structures;

EN 1090: Execution of steel structures and aluminum structures.

STRUCTURAL BOLTING ASSEMBLIES

Reference standard

- **EN 1993-1-8:2005/AC:2009**

  Eurocode 3 – Design of steel structures – Part 1-8: Design of joints

Eurocode 3 applies to the structural design of buildings and civil engineering steel works. This part specializes in the design of steel structures. As a part of the Eurocode series, this standard shares the best practice methods for the design of joints that are mainly subjected to loading – using steel grades S235, S275, S355 and S460.

EN 1993-1-8 first explains the basis of the design, then it looks at the **connections made with bolts – including bolted joints,** riveted joints and welded joints – and pins. The standard also defines welded connections and demonstrates how to do an analysis, such as a rigid or elastic plastic global analysis. Other topics include the classification of joints, the modelling of beam-to-column joints and the structural joints connecting H or I sections.

It is currently under revision.

STRUCTURAL BOLTING ASSEMBLIES

Reference standard

- **EN 1090-2:2008+A1:2011**

  Execution of steel structures and aluminum structures - Part 2: Technical requirements for steel structures

EN 1090-2 defines all the requirements that should be taken into account for the execution of structural steelworks. This includes structures and manufactured components produced from hot rolled, structural steels; cold-formed components and sheeting; hot finished and cold-formed structural hollow sections, as well as austenitic-ferritic and ferritic stainless steel products. These standard specifications do not relate to the type and shape of the steel structure – such as buildings, bridges, plated or latticed components.

EN 1090-2 starts by defining the constituent products, such as steels, welding consumables and **mechanical fasteners.** It also looks at the preparation, welding, testing and erection of structural systems. Other topics include inspection and correction to ensure the maximum levels of quality control. The new document is currently under approval.

STRUCTURAL BOLTING ASSEMBLIES

High-strength structural bolting assemblies for preloading

Reference standard

Harmonized standard	Title
EN 14399-1:2015	General requirements
EN 14399-2:2015	Suitability for preloading
EN 14399-3:2015	System HR – Hexagon bolt and nut assemblies
EN 14399-4:2015	System HV – Hexagon bolt and nut assemblies
EN 14399-5:2015	Plain washers
EN 14399-6:2015	Plain chamfered washers
EN 14399-7:2007 (*)	System HR – Countersunk head bolt and nut assemblies
EN 14399-8:2007 (*)	System HV – Hexagon fit bolt
EN 14399-9:2009 (*)	System HR or HV – Direct tension indicators for bolt and nut assemblies
EN 14399-10:2009 (*)	System HRC – Bolt and nut assemblies with calibrated preload
(*) New documents under revision/approval	

STRUCTURAL BOLTING ASSEMBLIES

Reference standard

Non-preloaded structural bolting assemblies

Harmonized standard	Title
EN 15048-1:2016	General requirements
EN 15048-2:2016	Fitness for purpose

Thank you for your attention

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