

NON-PRELOADED STRUCTURAL BOLTING ASSEMBLIES ACCORDING TO EN15048



Non-Preloaded ass.

Bolting assemblies according to EN 15048-1 can be used where no preloading or special provisions for contact surfaces are required, such as shear connections. In case of tension connections they should be used only where no preloading is required.

This category should not be used where the connections are frequently subjected to variation of tensile loading. However, they may be used in connections designed to resist wind loads (EN 1993-1-8).

Washers or other elements can be used additionally if necessary but they are not mandatory.

EN 15048-1 applies to bolting assemblies from M5 to M39 to be used in aluminium or aluminium alloy structures according to EN 1090-3 and from M12 to M39 to be used in steel structures according to EN 1090-2.

The use of thread sizes larger than M39 is not precluded, providing that all the applicable requirements are met.

Only bolting assemblies are covered by this harmonized standard: separate bolts or nuts, not tested as part of an assembly lot in accordance with EN 15048-2, are not covered by this harmonized standard and cannot be CE marked.

High-strength structural bolting assemblies for preloading according to EN 14399-1 are also suitable for use in non-preloaded structural bolting.

Product Requirements

As it is not a product standard, EN 15048 does not specify dimensions, tolerances on dimensions, form and position that shall be in accordance with the relevant product standards.

The general references to published standards (ref. to EN 15048-1, EN 1090-2, EN 1993-1-8) are:

- ISO 4014, 4016, 4017, 4018, 4032, 4033, 4034 for hexagon products
- ISO 2320, 7040, 7041, 7042, 7719, 10511, 10512, 10513 for prevailing torque nuts
- ISO 7089, 7090, 7091, 7092, 7093, 7094 for washers (if required)

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Product Requirements

In case washers are required for use with non-preloaded structural bolting assemblies:

- Washers with a minimum hardness of 100 HV can be combined with any property class of bolting assemblies made of the same type of material (steel, alloy steel, stainless steel);
- Washers made of carbon or alloy steel: a minimum hardness of 300 HV is required for property class 8.8 and 10.9 in a single lap joint with only one bolt or single row of bolts, in accordance with EN 1993-1-8:2005, 3.6.1;
- No minimum hardness requirements exist for washers made of aluminium or aluminium alloy.

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Essential Characteristics (to be declared in DoP)

- ❖ Type
- ❖ Property class
- ❖ Product grade

Essential Characteristics

❖ **Type (bolting assemblies)**

Type “SB”, linked with the property class of the bolts, covers the axial load of the structural bolting assembly assumed in the design.

The geometry of the head is relevant for the ability of the bolting assembly to be loaded by tension.

The cross section of the shank is relevant for the ability of the bolting assembly to be loaded by shear.

Characteristics to be assessed: axial load of the bolting assembly (bolt and nut).

Reference standards: ISO 898-1, ISO 3506-1 or EN 28839.

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Essential Characteristics

❖ Property class (bolting assemblies)

The property class expresses in a concise way a set of mechanical characteristics of the components. It is relevant for the ability of the components to be matched together in order to obtain the declared performances of the bolting assemblies.

Characteristics to be assessed: elongation under tensile load (bolts), tensile strength (bolts), strength under wedge loading (bolts), tensile yield strength (bolts), proof load (nuts and bolts), impact strength (bolts), hardness (bolts and nuts).

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Essential Characteristics

❖ Property class (bolting assemblies)

Reference standards:

ISO 898-1 bolts made of carbon or alloy steel - property class 4.6, 4.8, 5.6, 5.8, 6.8, 8.8, 10.9

ISO 898-2 nuts made of carbon or alloy steel - property class 5, 6, 8, 10, 12

ISO 3506-1 bolts made of austenitic stainless steel - property class 50, 70, 80

ISO 3506-2 nuts made of austenitic stainless steel - property class 50, 70, 80

EN 28839 bolts and nuts made of aluminium or aluminium alloy property class AL1 to AL6

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STRUCTURAL BOLTING ASSEMBLIES

Essential Characteristics

❖ **Product grade (bolts, nuts, washers and, if provided, direct tension indicators)**

Product grade covers tolerances on dimensions and shape for bolts and nuts. It is relevant for the ability of the components to be matched together in order to reach the declared performances of the bolting assemblies.

Characteristics to be assessed:

Bolts: shank diameter in accordance with ISO 4759-1.

Bolts and nuts: Thread tolerance in accordance with ISO 965-1, ISO 965-2, ISO 965-3, ISO 965-4 or ISO 965-5 (ISO 6g, 6H, 6AZ).

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Example of the information contained in the Dop

1. Unique identification code of the product-type: Non-preloaded structural bolting assemblies.
2. Type, batch or serial number or any other element allowing identification of the construction product as required under Article 11 (4): Non-preloaded structural bolting assemblies.
3. Intended use of the construction product, in accordance with the applicable harmonised technical specification, as foreseen by the manufacturer: Structural metallic works.
4. Name, registered trade name or registered trade mark and contact address of the manufacturer as required under Article 11 (5): SBE-VARVIT S.p.A. - Via dei Bagni, 26 - 34074 Monfalcone (GO) – Italy - Tel. (+39) 0481 7146 - Fax (+39) 0481 714714 - e-mail: info@vescovinigroup.com
5. Where applicable, name and contact address of the authorised representative whose mandate covers the tasks specified in Article 12 (2): Not applicable
6. System of assessment and verification of constancy of performance of the construction product as set out in CPR, Annex V: System 2+
7. In case of declaration of performance concerning a construction product covered by a harmonised standard: TÜV Italia S.r.l., notified body for factory production control certification n. 0948, performed the initial inspection of the manufacturing plant and of factory production control and the continuous surveillance, assessment and evaluation of factory production control and issued the certificate of conformity of the factory production control N. 0948-CPR-0104 rev. 4.
8. Declared performance

| Caratteristiche essenziali / Essential characteristics / Caractéristiques essentielles / Wesentliche Merkmale | Prestazione / Performance / Performances / Leistung | Specifica tecnica armonizzata / Harmonised technical specification / Spécifications techniques harmonisées Harmonisierte technische Spezifikation | |
|------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------|
| Tipo / Type / Type / Art | SB | EN 15048-1:2016 | |
| Classe di resistenza / Property class / Class de résistance / Festigkeitsklasse | 8.8 / 8 10.9 / 10 | | |
| Prodotto di grado / Product grade / Produit de qualité / Produktklasse | Viti / Screw / Vis / Schrauben: | | A,B,C ISO 4759-1 |
| | Dadi / Nuts / Ecorus / Muttern: | | A,B,C ISO 4759-1 |
| | Rondelle / Washers / Rondelles / Scheiben: | A,C ISO 4759-3 | |

9. The performance of the product identified in points 1 and 2 is in conformity with the declared performance in point 8. This declaration of performance is issued under the sole responsibility of the manufacturer identified in point 4.

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Delivery condition

The manufacturer shall supply the bolting assemblies either in an original unopened single sealed container, or alternatively in original unopened separate sealed containers. The suitability for tensile loading of the bolting assemblies supplied to the purchaser shall be demonstrated by the tensile test in accordance with the harmonized standard.

Bolting assemblies shall be supplied according to one of the following alternatives:

- a) Bolts and nuts supplied together as a set by one manufacturer. The components of the bolting assemblies shall be packed together in one package that shall be labelled with the single bolting assembly lot number and the manufacturer's identification. The suitability test shall be performed on each single bolting assembly lot;
- b) Bolts and nuts supplied by one manufacturer. Each type of component may be packed in separate packages that shall be and labelled with the manufacturing lot number of the components and the manufacturer's identification. The bolting assemblies components are interchangeable within the deliveries of an extended bolting assembly lot. The suitability test shall be performed on each extended bolting assembly lot.

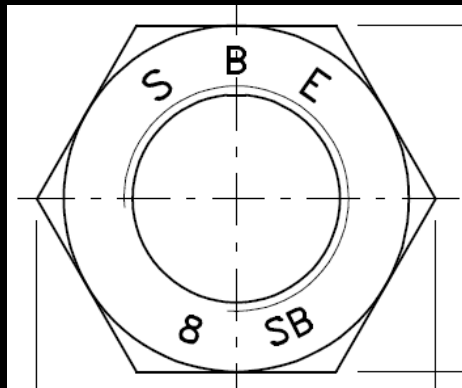
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Marking

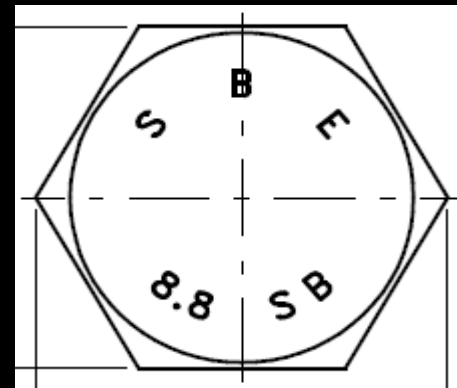
In addition to the binding marking requirements (ISO 898-1, ISO 898-2, ISO 3506-1, ISO 3506-2 and EN 28839), bolts and nuts shall be marked with the special marking “SB” (for use in Structural Bolting).

Marking may be either embossed or indented on the top surface of the bolt head or on the end of studs and stud bolts, and on one of the nut bearing surfaces.

NUT



BOLT



Tightening method (EN 1090-2)

Each bolt assembly shall be brought at least to a snug-tight condition, with special care being given to avoid over-tightening especially for short bolts and little thread sizes. The tightening process shall be carried out from bolt to bolt of the group, starting from the most rigid part of the connection and moving progressively towards the least rigid part. To achieve an uniform snug-tight condition, more than one cycle of tightening may be necessary.

The most rigid part is commonly in the middle of the connection or besides the flanges.

The term “snug-tight” can generally be considered as the condition achievable by the effort of one man using a normal sized spanner without an extension arm, and can be set as the point at which a percussion wrench starts hammering.

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Thank you for your attention



VESCOVINI GROUP

