



## Confirmation of Product Type Approval

**Company Name:** HILTI AKTIENGESELLSCHAFT

**Address:** FELDKIRCHERSTR. 100 Liechtenstein

**Product:** Fastening System

**Model(s):** Hilti X-BT-GR, X-BT-MR and X-BT-ER threaded fasteners

Certificate Type	Certificate Number	Issue Date	Expiry Date
Product Design Assessment (PDA)	18-HS175518-1-PDA	21-OCT-2019	29-JUL-2023
Manufacturing Assessment (MA)	16-MF3186309	10-AUG-2016	30-AUG-2021
Product Quality Assurance (PQA)	NA	NA	NA

### Tier

3

### Intended Service

For fastening of fastened materials to base materials of carbon steel or stainless steel in ships and in offshore structures.

### Description

Fasteners Models: X-BT-MR, X-BT-GR, X-BT-ER

Fasteners: X-BT-MR M6/14 SN 8, X-BT-MR M6/10 SN 8, X-BT-MR W6/14 SN 8, X-BT-MR W6/10 SN 8, X-BT-MR M8/14 SN 8, X-BT-MR M10/15 SN 8, X-BT-MR W10/15 SN 8, X-BT-GR M8/7 SN 8

Grounding and bonding equipment: X-BT-ER M6/7 SN 8, X-BT-ER W6/7 SN 8, X-BT-ER W6/3 SN 8, X-BT-ER M6/3 SN 8, X-BT-ER M10/7 SN 8, X-BT-ER W10/7 SN 8, X-BT-ER M8/7 SN 8

Drilling Tool: SF BT 22-A, SF BT 18-A, XBT 4000-A

Fastening Tool: Powder-actuated DX 351-BT/BTG, Battery-actuated BX 3-BT

Materials at least equivalent to A4/AISI grade 316 material

### Ratings

1. Refer to "New Generation Hilti X-BT-GR, X-BT-MR and X-BT-ER Threaded Fastener Specification, July 2019" for the recommended maximum tension and shear loads, in association with the 'Conditions for recommended loads' specified therein (see attachment).

2. Service Temperature: -40 to 100 degrees Celsius

### Service Restrictions

1) Unit Certification is not required for this product. If the manufacturer or purchaser request an ABS Certificate for compliance with a specification or standard, the specification or standard, including

inspection standards and tolerances, must be clearly defined.

2) The Hilti X-BT fastenings are to be used for fastening various materials to base metals of carbon/stainless steel in ship and off-shore structures, according to the "New Generation Hilti X-BT Threaded Fastener Specification, July 2019".

3) To ensure that proper anchoring/fastening mechanisms take place, (i.e. pressing and fusing), the following fastening tools as recommended by the manufacturer shall be used: Drill bit: TX-BT 4.7/7-80, TX-BT 4.7/7-110, TX-BT 4.7/7-150. Powder-actuated fastening tool: DX 351-BTG for X-BT-GR M8/7 SN 8, DX 351 BT for all other fastener models. Power Load 6.8/11M Brown. Battery-actuated fastening tool: BX 3-BTG for X-BT-GR M8/7 SN 8, BX 3-BT for X-BT-MR M6/10 SN 8, X-BT-MR W6/10 SN 8, X-BT-MR M8/14 SN 8, X-BT-ER M6/3 SN 8, X-BT-ER W6/3 SN 8, X-BT-ER M8/7 SN 8 and all other fastener models with M10 and W10 thread.

4) Application requirements and limits for the thickness of fastened material, thickness of base material spacing and edge distance, fastener selection and other installation details refer to "New Generation Hilti X-BT Threaded Fastener Specification, July 2019".

5) When type approved X-BT fasteners are to be used on structural members that are sensitive to stress patterns or variations and in areas where notch toughness is of paramount importance, the Class F curve in-air condition applies for fatigue design in case where the base material thickness  $\geq 8$  mm, edge distance  $\geq 15$  mm. This is applicable for structural steel grades with nominal yield strength ranging from 235 to 960 N/mm<sup>2</sup>

6) When type approved X-BT fasteners are to be used on structural members that are sensitive to stress patterns or variations and in areas where notch toughness is of paramount importance, the fatigue categories 100 (m=5) according to EN 1993-1-9 (2005), as described in the "New Generation Hilti X-BT Threaded Fastener Specification, July 2019", are applicable to the use of base material for S235 up to S460 grades according to EN 10025-2, EN 10025-3, EN 10025-4 and EN 10225 and for S690Q to S960Q grades according to EN 10025-6 in case where the base material thickness  $\geq 8$  mm, edge distance  $\geq 15$  mm.

7) Type approved X-BT fasteners are NOT to be used for the following locations:

7.1) On bulkheads/decks with a thickness less than 8 mm, in case through penetration of the base material is not acceptable. If through penetration is acceptable, the base material thickness can be reduced to minimum 4 mm.

7.2) Watertight boundaries

8) The battery-actuated tool BX 3-BT(G) is also suitable to drive the following previous generation X-BT threaded fasteners according to PDA 16-HS1545448-PDA: X-BT M8-15-6 SN12-R, X-BT M10-24-6 SN12-R, X-BT W10-24-6 SN12-R, X-BT-ER M8/7 SN 4, X-BT-ER M10/3 SN 4 and X-BT-ER W10/3 SN 4.

## Comments

The Manufacturer has provided a declaration about the control of, or the lack of Asbestos in this product

The Hilti X-BT fasteners may be used to fasten materials in areas where welding or drilling for bolting is permissible. It is recommended that fasteners be installed no closer than 6 mm from the edge of a flange or cutout and no closer than 15 mm between fasteners. The following additional guidance is provided for applications on ship structures:

a) Acceptable applications:

- a1) The securing of grating panels
- a2) The securing of checker plate
- a3) The securing of electrical cable trays
- a4) The securing of electrical cable clips
- a5) The securing of joiner bulkhead tracks to plating in deck modules
- a6) The securing of light duty fixtures and light hangers
- a7) Securing of items (i-vi) above in fire rated divisions
- a8) The securing of wall panel struts
- a9) The securing of exterior and interior outfitting
- a10) The securing of safety equipment
- a11) Use as grounding and bonding equipment
- b) Acceptable locations:
  - b1) On platform decks and flats
  - b2) On non-tight bulkheads
  - b3) On lower decks
  - b4) On transverse side frames
  - b5) In superstructures and deckhouse bulkheads
  - b6) On Topside Deck members and plating
  - b7) On Deck Modules
  - b8) On members and plating in non-tight bulkheads
  - b9) On members in longitudinal and traverse frames of hulls
  - b10) On fire rated bulkheads of superstructures with a minimum thickness of 6mm provided the fasteners are installed from the side opposite to the insulated side. Fasteners are not to be installed behind, or imbedded in, structural insulation and the insulation in no way is disturbed.
- c) Applications or locations where special care is recommended (see d below):
  - c1) In members with significant thermal stresses
  - c2) In highly stressed portions of members
  - c3) In members subject to high, cyclic loads
  - c4) Hangers for pipe systems with high thermal stresses
  - c5) Hangers for sprinkler systems
- d) The Hilti X-BT fasteners may be used for the applications where special care is recommended by following the manufacturer's recommendation. ABS approvals are general based on the product test reports furnished by recognized institutions and laboratories which may reflect specific local conditions. If any application is in a jurisdiction where the fasteners are subject to the approval process or specific guidelines are to be followed, the approved technical data or design guidelines take precedence over

technical data presented herein

### Notes, Drawings and Documentation

Report No. XE-18-12, Evaluation Report New Generation X-BT 2018-05-22, Revision: -, Pages: 130

Report No. New Generation X-BT Specification Draft, 2018-05-22, Specification Draft 2018-05-22, Revision: -, Pages: 63

Drawing No. X-BT-GR-M8 Part lists, X-BT-GR-M8 Part List, 2018-05-23, Revision: A5, Pages: 4

Drawing No. X-BT-MR-M-W6 Part lists, X-BT-MR-M-W6 Part List, 2018-05-23, Revision: A6, Pages: 9

Drawing No. X-BT-MR-M8 Part lists, X-BT-MR-M8 Part List, 2018-05-23, Revision: A6, Pages: 6

Drawing No. X-BT-MR-M-W10 Part lists, X-BT-MR-M-W10 Part List, 2018-05-23, Revision: A5, Pages: 6

Drawing No. X-BT-ER part lists, X-BT-ER Part List, 2018-05-23, Revision: A7, Pages: 10

Drawing No.5477480 / 2243869, Threaded Stud X-BT-HL M/W6/10, Revision: 01, Pages: 1

Drawing No.5492562 / 2251545, Threaded Stud X-BT-HL M6/10 SN 8, Revision: 01, Pages: 1

Drawing No.5492562 / 2250836, Threaded Stud X-BT-HL W6/10 SN 8, Revision: 01, Pages: 1

Report No. HTL-Rankweil Tension-Shear X-BT-GR 254-172, HTL-Rankweil Tension-Shear, 2017-12-04, Revision: -, Pages: 21

Report No. MPA-Stuttgart 9000742000 X-BT Marine-Environment, MPA-Stuttgart 9000742000 X-BT Marine-Environment, 2014-02-03, Revision: -, Pages: 32

Report No. MPA-Stuttgart 9034407000 New-Generation-X-BT, MPA-Stuttgart 9034407000 New-Generation-X-BT, 2018-01-08, Revision: --, Pages: 14

Report No. Electrosuisse 17-IK-0260-S01 New-Generation-X-BT-ER Grounding, Electrosuisse 17-IK-0260-S01 New-Generation-X-BT-ER Grounding, 2017-11-22, Revision: --, Pages: 6

Report No. Universität Stuttgart, Institut für Konstruktion und Entwurf, 19.5.2018, Nr. 2018-13X, Fatigue classification of the constructional detail "Structural steel base material with the Hilti power-actuated threaded fasteners X-BT-GR and X-BT-MR", Revision: -, Pages: 54

Report No. Dehn FRM-1659 X-BT-Lightning-EN-62561-1, Dehn FRM-1659, 2017-03-17, Revision: -, Pages: 34

Report No. HTL Rankweil #076-19, BX3-BT Equivalency, 2019-07-24, Revision: -, Pages: 61

Report No. Hilti Report XE-19-22, Validation of fastening tool BX 3-BT(G), 2019-07-30, Revision: -, Pages: 24

Report No. Hilti X-BT Specification, New Generation Hilti X-BT-GR, X-BT-MR and X-BT-ER Threaded Fastener Specification, July 2019, Revision: -, Pages: 73

### Term of Validity

This Product Design Assessment (PDA) Certificate remains valid until 29/Jul/2023 or until the Rules and/or Standards used in the assessment are revised or until there is a design modification warranting design reassessment (whichever occurs first).

Acceptance of product is limited to the "Intended Service" details prescribed in the certificate and as per applicable Rules and Standards.

This Certificate is valid for installation of the listed product on ABS units which exist or are under contract for construction on or previous to the effective date of the ABS Rules and standards applied at the time of PDA issuance. Use of the Product for non-ABS units is subject to agreement between the

manufacturer and intended client.

**ABS Rules**

Rules for Conditions of Classification, Part 1 – 2018 Steel Vessel Rules 1-1-4/7.7, 1-1-A3, 1-1-A4

ABS Rules for Conditions of Classification, Part 1 – 2018 Offshore Units and Structures 1-1-4/9.7, 1-1-A2, 1-1-A3, which covers the following:

ABS Rules for Building and Classing Mobile Offshore Units (2019) 3-2-2/9; 4-3-3/5.9

**International Standards**

2010 (2012 Edition) IMO Fire Test Procedures Code/Annex 2;

2004 EN 10025-2: Part 2: Technical delivery conditions for non-alloy structural steels;

2004 EN 10025-3: Part 3: Technical delivery conditions for normalized/normalized rolled weldable fine grain structural steels;

2004 EN 10025-4: Part 4: Technical delivery conditions for thermomechanically rolled weldable fine grain structural steels;

2004 EN 10025-6: Part 6: Technical delivery conditions for flat products of high yield strength structural steels in the quenched and tempered condition;

2005 EN 1993-1-9: Eurocode 3: Design of steel structures;

2009 EN 10225: Weldable structural steels for fixed offshore structures: Technical delivery conditions;

**EU-MED Standards**

NA

**National Standards**

NA

**Government Standards**

NA

**Other Standards**

Manufacturer's Standards



A handwritten signature in black ink, appearing to read 'James J. White'.

Corporate ABS Programs  
American Bureau of Shipping  
Print Date and Time: 22-Oct-2019 3:52

ABS has used due diligence in the preparation of this certificate, and it represents the information on the product in the ABS Records as of the date and time the certificate is printed.

If the Rules and/or standards used in the PDA evaluation are revised or if there is a design modification (whichever occurs first), a PDA revalidation may be necessary.

The continued validity of the MA is dependent on completion of satisfactory audits as required by the ABS Rules. The validity of both PDA and MA entitles the product to receive a **Confirmation of Product Type Approval**.

Acceptance of product is limited to the "Intended Service" details prescribed in the certificate and as per applicable Rules and

Standards.

This Certificate is valid for installation of the listed product on ABS units which exist or are under contract for construction on or prior to the effective date of the ABS Rules and standards applied at the time of PDA issuance. ABS makes no representations regarding Type Approval of the Product for use on vessels, MODUs or facilities built after the date of the ABS Rules used for this evaluation.

Type Approval requires Drawing Assessment, Prototype Testing and assessment of the manufacturer's quality assurance and quality control arrangements. The manufacturer is responsible to maintain compliance with all specifications applicable to the product design assessment. Unless specifically indicated in the description of the product, certification under type approval does not waive requirements for witnessed inspection or additional survey for product use on a vessel, MODU or facility intended to be ABS classed or that is presently in class with ABS.

Due to wide variety of specifications used in the products ABS has evaluated for Type Approval, it is part of our contract that; whether the standard is an ABS Rule or a non-ABS Rule, the Client has full responsibility for continued compliance with the standard.

Questions regarding the validity of ABS Rules or the need for supplemental testing or inspection of such products should, in all cases, be addressed to ABS.