



CERTIFICATE NUMBER
EFFECTIVE DATE
EXPIRY DATE
ABS TECHNICAL OFFICE

23-2361769-PDA
09-Mar-2023
08-Mar-2028
Houston SED - Commercial,
Existing Vessels

CERTIFICATE OF Product Design Assessment

This is to certify that a representative of this Bureau did, at the request of

HILTI AKTIENGESELLSCHAFT

located at

FELDKIRCHERSTR. 100, , 9494 SCHAAN, Liechtenstein

assess design plans and data for the below listed product. This assessment is a representation by the Bureau as to the degree of compliance the design exhibits with applicable sections of the Rules. This assessment does not waive unit certification or classification procedures required by ABS Rules for products to be installed in ABS classed vessels or facilities. This certificate, by itself, does not reflect that the product is Type Approved. The scope and limitations of this assessment are detailed on the pages attached to this certificate.

Product: Fastening System
Model: S-BT HL screw-in stainless steel multi-purpose threaded fasteners: S-BT-MR M10 HL,
S-BT-MR W10 HL, S-BT-MR M8 HL, S-BT-MR M10 HL AL, S-BT-MR W10 HL AL,
S-BT-MR M8 HL AL
S-BT HL s...
Endorsements:
Tier: 3 - Type Approved, unit certification not required

This Product Design Assessment (PDA) Certificate remains valid until 08/Mar/2028 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.

American Bureau Of Shipping


Subramani Ragunathan, Engineer/Consultant

NOTE: This certificate evidences compliance with one or more of the Rules, Guides, standards or other criteria of ABS or a statutory, industrial or manufacturer's standards. It is issued solely for the use of ABS, its committees, its clients or other authorized entities. Any significant changes to the aforementioned product without approval from ABS will result in this certificate becoming null and void. This certificate is governed by ABS Rules 1-1-A3/5.9 Terms and Conditions of the Request for Product Type Approval and Agreement (2010)

HILTI AKTIENGESELLSCHAFT

FELDKIRCHERSTR. 100

9494 SCHAAN

Liechtenstein

Telephone: +4981 9190 6303

Fax:

Email: erwin.schoeffendt@hilti.com

Web: www.hilti.com

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Product: Fastening System

Model: S-BT HL screw-in stainless steel multi-purpose threaded fasteners: S-BT-MR M10 HL, S-BT-MR W10 HL, S-BT-MR M8 HL, S-BT-MR M10 HL AL, S-BT-MR W10 HL AL, S-BT-MR M8 HL AL
S-BT HL screw-in carbon steel multi-purpose threaded fasteners: S-BT-MF M10 HL, S-BT-MF MT M10 HL, S-BT-MF W10 HL, S-BT-MF MT W10 HL, S-BT-MF M8 HL
S-BT screw-in stainless steel threaded fasteners for electrical purposes: S-BT-ER M10 HL, S-BT-ER W10 HL, S-BT-ER M8 HL, S-BT-ER M10 HC 120 HL, S-BT-ER W10 HC 4/0 HL
S-BT screw-in carbon steel threaded fasteners for electrical purposes: S-BT-EF M10 HL, S-BT-EF W10 HL, S-BT-EF M8 HL, S-BT-EF M10 HC 120 HL, S-BT-EF W10 HC 4/0 HL
S-BT screw-in stainless steel threaded fasteners for gratings: S-BT-GR M8 HL, S-BT-GR M8 HL AL (in association with Composite Fasteners acc. to ABS PDA 22-2285526-PDA)
S-BT screw-in carbon steel threaded fasteners for gratings: S-BT-GF M8 (in association with Composite Fasteners acc. to ABS PDA 22-2285526-PDA)

Endorsements:

Intended Service:

For fastening of fastened materials to base materials of carbon steel or aluminum in the Ship and Shipbuilding environment and in Offshore Structures.

Description:

1. In the S-BT HL fasteners, the threaded stud is set into a small pre-drilled blind pilot hole and the drill entry point is then completely sealed by the stud washer during setting. This doesn't require any rework of the protective surface coating because there is no through penetration of the base material.
2. For the S-BT System there is also the possibility to set the stud into a drill through hole in thin base material. In this case a rework of the protective surface on the backside is potentially needed.
3. Dimensions and material specifications of S-BT HL fasteners: refer to the Data Sheets "Hilti Product Data Sheet –S-BT HL screw-in stainless steel and carbon steel threaded studs", "Hilti Product Data Sheet – S-BT-ER (HC) HL /-EF (HC) HL screw-in threaded studs for electrical connections")
4. The fasteners are to be installed and inspected using installation procedures and tools recommended by the manufacturer as in the Data Sheet:
 - a) Drilling tool: SBT 4-A22, SF 6-(A)22 or SBT 6-22 with drill assist;
 - b) Drill bits: TS-BT 5.3-65 S, TS-BT 5.3-95 S, TS-BT 5.5-74 AL.
5. Base material thickness tII and type of bore hole:
 - a) Blind pilot hole, base material steel: tII >= 6 mm [0.24"];
 - b) Blind pilot hole, base material aluminum: tII >= 6 mm [0.24"];
 - c) Drill through hole, base material steel: 6 mm [0.24"] > tII >= 3mm [0.12"];
 - d) Drill through hole, base material aluminum: 6 mm [0.24"] > tII >= 5mm [0.20"].

Rating:

1. Refer to the Data Sheets in the attachment ("S-BT HL screw-in stainless steel and carbon steel threaded studs (Datasheet)", "S-BT-ER (HC) HL and S-BT-EF (HC) HL screw in stainless steel and carbon steel threaded studs for electrical connections (Datasheet)") for the recommended maximum loading in tension, shear, moment and torque, in

HILTI AKTIENGESELLSCHAFT

FELDKIRCHERSTR. 100

9494 SCHAAN

Liechtenstein

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Fax:

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Web: www.hilti.com

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association with the recommended loads specified therein.

2. Refer to the Data Sheets for the application requirements to the followings:

- a) Base material thickness and type of bore hole;
- b) Thickness of fastened material;
- c) Edge distance ≥ 6 mm [0.24"]; Spacing ≥ 18 mm [0.71"] for S-BT M8 HL; Spacing ≥ 22 mm[.87] for S-BT M10 HL and S-BT W10 HL
- d) Corrosion information.

3. Service Temperature: -40 to +100 degree (Celsius)

Service Restriction:

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.

1) The base material is limited to steel grade with the following properties:

- a) For Steel as base material, Maximum ultimate tensile strength of steel $f_u = 760$ MPa [110 ksi] & Minimum ultimate tensile strength of steel $f_u \geq 360$ MPa [52 ksi];
- b) For Aluminum as base material, Minimum ultimate tensile strength of aluminum $f_u \geq 270$ MPa [39 ksi];
- c) Minimum thickness of base material tII: refer to the Data Sheet;
- d) Maximum thickness of base material tIII: no limits.

2) In general, type approved S-BT HL fasteners are NOT to be used for the following:

- a) Shell plating (i.e. bottom plating, side plating, main deck plating);
- b) Tank Boundaries
- c) Weathertight boundaries where through penetration of the base materials is required;
- d) Fire rated boundaries;
- e) Structural members which require fatigue design;
- f) Members with thermal stresses;
- g) Highly stressed structural members

3) For Watertight Boundaries, the installation shall be to a doubler plate, with no through penetration, welded onto the bulkhead/deck plating.)

4) Hilti fasteners often may be used for the listed applications by following the Manufacturer's recommendations and guidance. The attending Surveyor and Owner are to be consulted and agree with the use of the fasteners;

5) Hilti fasteners may also be used for additional applications other than those listed above. Some applications may require an engineering review in advance.

6) Structural members that are sensitive to stress patterns or variations and in areas where notch toughness is of paramount importance, the curve class S-BT HL (as per Datasheet) applies for design for base materials of thickness ≥ 3 mm and yield strength ranging from 235 MPa to 355 MPa at an edge distance ≥ 15 mm.

For more Service Restrictions please see the "Appendix - Service Restrictions" attached to the ABS approval letter in Task # T2361769

Comments:

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

Notes/Drawing/Documentation:

Drawing No. 084/22: ETA Approval tests with screw-in threaded studs S-BT HL according to EAD 333037-00-0602: 2020-04

HILTI AKTIENGESELLSCHAFT

FELDKIRCHERSTR. 100

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Drawing No. 5214'029'374/e: Constant Amplitude Fatigue Tests

Drawing No. 5651457 / 05 / 697424: Threaded stud S-BT-xR HL Gewindebolzen S-BT-xR HL

Drawing No. 5651472 / 03 / 691754: Threaded stud S-BT HL Gewindebolzen S-BT HL

Drawing No. 5651499 / 03 / 697424: Threaded stud S-BT-xF HL Gewindebolzen S-BT-xF HL

Drawing No. D-PL-20356-01-00: Deutsche Akkreditierungsstelle - Accreditation Certificate

Drawing No. ETA-23-0001: European Technical Assessment issued 2023-02-16

Drawing No. Nr. 2022-55X: Hilti screw-in threaded stud S-BT HL (High Load) Evaluation Report

Drawing No. S-BT HL: S-BT HL screw-in stainless steel and carbon steel threaded studs (Datasheet)

Drawing No. S-BT-ER (HC) HL / S-BT-EF (HC) HL: S-BT-ER (HC) HL and S-BT-EF (HC) HL screw in stainless steel and carbon steel threaded studs for electrical connections (Datasheet)

Drawing No. STS 0053: Swiss Accreditation

Terms of Validity:

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STANDARDS

ABS Rules:

2023 ABS Rules for Conditions of Classification, 1-1-4/7.7, 1-1-A3, 1-1-A4

2023 ABS Rules for Conditions of Classification – Offshore Units and Structures 1-1-4/9.7, 1-1-A2, 1-1-A3, which covers the following

2023 ABS Rules for Building and Classing Mobile Offshore Units 3-2-2/9, 4-3-3/5.9

ABS Guide for Fatigue Assessment of Offshore Structures - 2020

National:

NA

International:

BS EN 1993-1-3: EAD 333037-00-0602 Threaded studs for connections of materials to structural steel and aluminium members 2020

Government:

NA

EUMED:

NA

OTHERS:

Manufacturer's Standards

Appendix

Comments:

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

In general, the Hilti S-BT HL fasteners may be used to fasten materials in areas where welding or drilling for bolting is permissible e. g. gratings, installation channels, installation rails, junction boxes and lighting, control panels, cable trays, cable channels. It is recommended that fasteners be installed no closer than 6 mm [0.24"] from the edge of a flange or cutout and no closer than 18 mm [0.71"] between fasteners. The following additional guidance is provided for applications on ship structures:

1) Acceptable applications:

- a) The securing of grating panels for S-BT-GR M8 HL and S-BT-GF M8, models along with X-FCM-R and X-FCM-F
- b) The securing of checker plate: used as grating
- c) The securing of electrical cable trays
- d) The securing of electrical cable clips
- e) The securing of joiner bulkhead tracks to plating in deck modules (with FTP approval)
- f) The securing of light duty fixtures and light hangers
- g) The securing of wall panel struts
- h) The securing of exterior and interior outfitting
- i) The securing of safety equipment
- j) Use of S-BT-EF HL, S-BT-ER HL, S-BT-EF (HC) HL & S-BT-ER (HC)HL models as grounding and bonding equipment.

2) Acceptable locations:

- a) Locations other than those listed in "Service Restrictions". Some example of

acceptable locations are as follows, provided they do not have "Service Restriction" applicability:

- i) Platform decks & flats
- ii) Non-tight bulkheads
- iii) Lower decks
- iv) Transverse side frames
- v) Superstructure & Deckhouse bulkheads and decks with a minimum thickness 6.4 mm (1/4" inch). without drilling through the bulkhead and deck plates
- vi) Topside Deck members and plating
- vii) Deck modules
- viii) Longitudinal and Transverse Frames of hulls

3) The fasteners may also be used for applications other than those listed above, where special care is recommended by following the manufacturer's recommendation, such as hangers for pipe systems with high thermal stresses and sprinkler systems. Such applications must be to the satisfaction of the attending surveyor.

4) The intended use comprises connections for indoor (mainly the carbon steel fasteners) and outdoor applications (mainly the stainless steel fasteners) with predominantly static loads (e.g. dead loads).

5) 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. The arrangement and details of each vessel-specific installation are to be reviewed to ABS Rules as applicable