DNV·GL

Certificate No:
TAS00002UR

TYPE APPROVAL CERTIFICATE

This is to certify:

That the Structural Connecting Elements

with type designation(s)
HILTI X-U and EDS

Issued to
Hilti AG
Schaan, Liechtenstein

is found to comply with
EN 1993-1-9:2005 Eurocode 3: Design of steel structures – Part 1-9: Fatigue

Application :

Product(s) approved by this certificate is/are accepted for installation on all vessels classed by DNV GL.

Issued at **Hamburg** on **2020-12-11**
This Certificate is valid until **2025-12-10**.
DNV GL local station: **Hamburg – CMC North/East**

Approval Engineer: **Christof Kotzmann-Bendrien**

for **DNV GL**

Olaf Drews
Head of Section

This Certificate is subject to terms and conditions overleaf. Any significant change in design or construction may render this Certificate invalid. The validity date relates to the Type Approval Certificate and not to the approval of equipment/systems installed.

LEGAL DISCLAIMER: Unless otherwise stated in the applicable contract with the holder of this document, or following from mandatory law, the liability of DNV GL AS, its parent companies and subsidiaries as well as their officers, directors and employees ("DNV GL") arising from or in connection with the services rendered for the purpose of the issuance of this document or reliance thereon, whether in contract or in tort (including negligence), shall be limited to direct losses and under any circumstance be limited to 300,000 USD.

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Product description

X-U and EDS Fastening Systems:

X-U powder-actuated fastener
Type X-U16 to X-U72, assembled as single fastener
with washers P8, P8TH, P8S15 or S12 or as collated fasteners MX

EDS powder-actuated fastener
Type EDS19 P10, EDS22 P10, EDS27 P10, assembled as single fastener with washer P10

Hilti fastening tool
Type DX 460, DX 5 and DX 6 for X-U and EDS, DX 76 and DX 76 PTR for EDS

Hilti cartridge
Type 6.8/11M for DX 460 and DX 5, DX 6-cartridge for DX 6, 6.8/18M for DX 76 and DX 76 PTR

Application/Limitation

The mentioned products may be used for fastening various materials to base metals of carbon steel in ship structures as follows:

- Cable, conduit and tubing connectors to steel
- Trays, channels and struts to steel for cable, conduit and tubing runs
- Instrumentation, junction boxes, lighting
- Pipe hangers
- Signage
- Door frames
- Mounting cabinets, securing furniture, utensils, etc.

The fasteners may also be used for applications other than those listed above, subject to special consideration either by the local DNV GL Surveyor.

The minimum base material strengths are to be at least 360 [N/mm²]. In general the installation of the fasteners may be carried out in areas where welding or drilling for bolting is permissible. Fasteners are not be installed closer than 15 [mm] from the edge of a flange or cut out and closer than 20 [mm] between fasteners.

Fatigue design to carbon steel base material:

The X-U and EDS fasteners are to be allowed for use on structural members made from carbon steel that require fatigue verification.
Fatigue verification of structural members in ship structures have to be made with the corresponding DNVGL Rules for Classification and Construction and are subject to special consideration of DNV GL.

Description of constructional detail:

Structural steel base material with Hilti X-U and EDS powder-actuated fastener.

Requirements/ Limitations:

The nominal stress range [N/mm²] is to be calculated by the gross cross-section fulfilling the requirements of the nominal stress approach.
Plate thickness: 6 [mm] ≤ t ≤ 60 [mm]
Minimum edge distance: 15 [mm]
Structural steel grades: S235 up to S355 according to EN 10025-2

The X-U and EDS fasteners are not to be used in the following locations:

- for attachment of structural fire protection insulation
- on bulkheads and decks with a thickness less than 6 [mm]
- on the shell plating, sea chests and collision bulkheads

The selection of the HILTI X-U and EDS Fastening System for the corresponding application and the proper assembly are to be in accordance with the instructions of the manufacturer and the current Rules of DNVGL as applicable.

Type Approval documentation

Hilti Test Program-No.: STQA50002A, dated: 2006-12-28
Hilti Test Program-No.: STQA50002F, dated: 2006-07-14
Hilti Direct Fastening Technology Manual
Hilti Pullout Testing with EDS 19 P10, 2015-09-25
ISO 9001:2008; ISO 14001:2004, dated. 2013-07-01
DNV GL Approval Ref.-No. 11-069328, 12-004312, 15-056411, 15-067232, 15-073637

Tests carried out

Documentation of tests performed, references provided and mentioned under TYPE APPROVAL DOCUMENTATION, are the basis for this type approval.

Marking of product

For traceability to this type approval the products are to be marked with:
• Manufacturers name or trademark
• Type designation

Periodical assessment

For retention of the Type Approval, a DNV GL surveyor shall perform a survey after 2 and 3,5 years and also before the expiry date of this certificate to verify that the conditions of the type approval are complied with.

The objective of the Periodical Assessment is to verify that the conditions for the Type Approval are not altered since the Type Approval Certificate was issued (see additionally DNVGL-CP-0338 – Class Program for Type Approval).

The main scope of the Periodical Assessment will normally include:

- Verification of the Type Approval applicant's production and quality system w.r.t. ensuring continued consistent production of the Type Approved products at the Type Approval applicant's own premises and at other companies that are given the responsibility for manufacturing of the products.
- Review of the Type Approval documentation and that this is still used as basis for the production
- Review of possible changes to the design, the material and the performance of the product
- Verification of the product marking.

End of Certificate