



Reference HST4-R substitution letter
Department Business unit Anchors
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Announcement of new product: Hilti HST4-R expansion anchor to replace Hilti HST3-R expansion anchor.

To whom it may concern:

For several years, Hilti has been providing the Hilti HST3-R stainless-steel expansion anchor for the most demanding anchoring applications in the construction industry in uncracked and cracked concrete with static and seismic loads. Although HST3-R is already an outstanding expansion anchor solution in the market, Hilti wants to take the expansion anchor technology further to provide an even more optimized fastening solution.

We are happy to announce that, after several years of intense research and development, Hilti is introducing HST4-R, the new generation of Hilti stainless steel expansion anchors. Similar to HST3-R, the HST4-R anchor is a torque-controlled, mechanical expansion anchor consisting of a threaded bolt, expanding sleeve, washer, and nut. Like HST3-R, HST4-R is approved for uncracked and cracked concrete conditions, static and seismic loads, and applications under fire exposure.

The Hilti HST4-R expansion anchor is now approved for a wider range of embedment depths and offers increased performance compared to its predecessor in a wide range of cases, significantly when tensile failure modes are decisive in the design. HST4-R portfolio includes metric sizes M8, M10, M12, M16 and M20.

Hilti has thoroughly tested HST4-R in accordance with the following:

- European Assessment Document EAD 330232-01-0601, Mechanical fasteners for use in concrete.
- European Assessment Document EAD 330232-01-0601-v02, Variant: Improved resistance to concrete cone failure for mechanical fasteners for use in concrete.
- European Assessment Document EAD 330232-01-0601-v03, Mechanical fasteners with variable embedment depth for use in concrete.

Based on this testing, the technical assessment body Centre Scientifique et Technique du Bâtiment (CSTB) has recently released the European Technical Assessment ETA-21/0878, which approved the use of HST4-R for fastening in concrete under:

- Static and quasi-static loading
- Seismic category C1 and seismic category C2
- Fire exposure



Based on the ETA 21/0878, for equal embedment depths, HST4-R is equal to or better than HST3-R with limited exceptions. Among these:

- For applications in tension close to the edge of the concrete slab, when splitting failure modes are relevant, we recommend using our PROFIS Engineering software to re-calculate the anchors utilization, especially related to splitting resistance. Using PROFIS Engineering enables efficient comparison of products with different qualification methods. In the case of HST4-R, the critical edge distance for splitting, $c_{cr,sp}$, is calculated based on the new EAD 330232-01-0601-v03, which require a different calculation than that used for HST3-R
- We further require using our PROFIS Engineering software to re-calculate the anchors' utilization, due to a possible lower capacity of HST4-R compared to its predecessor depending on geometrical constraints, for:
 - Applications with static loads using the Hilti filling set with sizes M8 to M12, where shear steel failure is the decisive failure mode.
 - Applications using size M10 where pryout is the decisive failure mode in shear.
 - Applications with seismic C1 using the Hilti filling set with sizes M8 to M16, where shear steel failure is the decisive failure mode.
 - Applications with seismic C2 loads using the Hilti filling set with size M12, where shear steel failure is the decisive failure mode.

The full ETA-21/0878 assessment for HST4 is accessible online at www.hilti.co.nz. Due to a dynamic environment concerning qualification and design, it is highly recommended to use PROFIS Engineering when replacing existing products with new ones, even if the latter has higher performance, PROFIS Engineering has now been updated with Hilti HST4-R, so that you can perform the necessary calculations and explore all its potential applications.

Yours truly,

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