Deutsches Institut für Bautechnik

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European Technical Assessment ETA-02/0030 of 10 July 2018

English translation prepared by DIBt - Original version in German language

General Part

Technical Assessment Body issuing the European Technical Assessment:	Deutsches Institut für Bautechnik
Trade name of the construction product	Highload Anchor SZ
Product family to which the construction product belongs	Mechanical anchor for use in concrete
Manufacturer	MKT Metall-Kunststoff-Technik GmbH & Co. KG Auf dem Immel 2 67685 Weilerbach
Manufacturing plant	MKT Metall-Kunststoff-Technik GmbH & Co. KG Auf dem Immel 2 67685 Weilerbach
This European Technical Assessment contains	22 pages including 3 annexes which form an integral part of this assessment
This European Technical Assessment is issued in accordance with Regulation (EU) No 305/2011, on the basis of	EAD 330232-00-0601
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ICC EVALUATION SERVICE

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ICC-ES Evaluation Report

ESR-3173*

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DIVISION: 03 00 00—CONCRETE
Section: 03 16 00—Concrete Anchors

Division: 05 00 00—METALS
Section: 05 05 19: —Post-Installed Concrete Anchors

REPORT HOLDER:

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EVALUATION SUBJECT:

MKT SZ CARBON STEEL AND SZ A4 STAINLESS STEEL, HIGH LOAD ANCHORS FOR CRACKED AND UNCRACKED CONCRETE

1.0 EVALUATION SCOPE

Compliance with the following codes:

- 2012, 2009, and 2006 *International Building Code®* (IBC)
- 2012, 2009, and 2006 *International Residential Code®* (IRC)
- 1997 *Uniform Building Code™* (UBC)

Property evaluated:

Structural

2.0 USES

The MKT SZ High Load Anchor is used to resist static, wind, and seismic tension and shear loads in cracked and uncracked normal-weight or sand-lightweight concrete having a specified compressive strength, f'_c, of 2,500 psi to 8,500 psi (17.2 MPa to 58.6 MPa).

The anchoring system complies with Section 1909 of the 2012 IBC and Section 1912 of the 2009 and 2006 IBC, and is an alternative to cast-in-place anchors described in Section 1908 of the 2012 IBC and Section 1911 of the 2009 and 2006 IBC and Section 1923.2 of the UBC. The anchors may also be used where an engineered design is submitted in accordance with Section R301.1.3 of the IRC.

3.0 DESCRIPTION

3.1 MKT SZ:

3.1.1 General: The MKT SZ Carbon Steel or MKT SZ Stainless Steel A4 High Load Anchor, designated as the SZ or SZ A4 respectively, is a torque-set, sleeve-type mechanical expansion anchor. The SZ is comprised of seven components which vary slightly according to anchor diameter, as shown in Figure 1 of this report. It is available in three head configurations, illustrated in Figure 1 of this report. The MKT SZ M16 and M20 carbon steel anchors are not available with a countersunk head.

All carbon steel and SZ M16 A4 parts receive a minimum 0.0002-inch-thick (5 µm) galvanized zinc coating according to EN ISO 4042.

Dimensions and installation criteria are set forth in Table 1. The anchors are manufactured using metric units.

3.1.2 SZ-B (Stud Style, Figure 1): The anchor consists of a threaded rod (1), hexagon nut (7), steel washer (2), distance sleeve (3), collapsible ring (4), steel expansion sleeve (5) and threaded cone (6) (See Figure 1). This anchor is available in carbon steel or in stainless steel A4. The material specifications are as follows:

- Threaded rod: Steel, strength class 8.8, EN ISO 898-1 or stainless steel, 1.4401, 1.4404 or 1.4571, EN 10088
- Hexagon nut: Steel, strength class 8, EN ISO 898-2 or stainless steel 1.4401 or 1.4571, EN 10088, ISO 3506, strength class 70, coated
- Washer: Steel, EN 10139 or stainless steel, 1.4401, 1.4404 or 1.4571, EN 10088
- Distance sleeve: Precision steel tubes DIN 2394/2393 or stainless steel, 1.4401, 1.4404 or 1.4571, EN 10088
- Ring: Polyethylene
- Steel expansion sleeve: Steel, EN 10139 or stainless steel 1.4401, 1.4404 or 1.4571, EN 10088
- Threaded cone: Steel, strength class 8, EN ISO 898-2 or stainless steel, 1.4401, 1.4404 or 1.4571 EN 10088, coated

Application of torque at the head of the anchor causes the cone to be drawn into the expansion sleeve. This in turn causes the sleeve to expand against the wall of the drilled hole. Application of the specified installation torque induces a tension force in the stud that is equilibrated by a precompression force in the concrete acting through the component being fastened. Deformation of the collapsible ring prevents buildup of precompression in the distance sleeve in cases where the sleeve is in contact with the washer, and permits the closure of gaps between the concrete and the component being fastened. Application of tension loads that exceed the precompression force in the bolt will cause the cone to displace further into the