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Designated according to Article 29 of Regulation (EU) No 305/2011

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European Technical Assessment ETA 18/0037 of 15/11/2018

I General Part

Technical Assessment Body issuing the ETA and designated according to Article 29 of the Regulation (EU) No 305/2011:	**Eurofins Expert Services Oy**
Trade name of the construction product	**HPKM 16, HPKM 20, HPKM 24, HPKM 30 and HPKM 39 column shoes**
Product family to which the construction product belongs	Column shoes
Manufacturer	**Peikko Group Oy** PL 104 FI-15101 Lahti Finland
Manufacturing plant	Peikko manufacturing plants
This European Technical Assessment contains	8 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 200102-00-0302

II Specific Part

1 Technical description of the product

The column shoes, illustrated in Figure 1, are connectors made of structural steel (EN 10025) and reinforcing steel bars (EN 1992-1-1). The components of a column shoe are connected to each other by welding. The steel material is specified in Annex 1.

The column shoe comprises a horizontal part called base plate, vertical side plate or plates that may be bent, vertical main anchorage bars and a bent rear bar. There may also be thin, non-structural steel plates that serve as moulds when concreting the column.

The geometry of the column shoes, the minimum size of the column cross-section and the anchor bolts to be used with the columns shoes are specified in Annex 2.

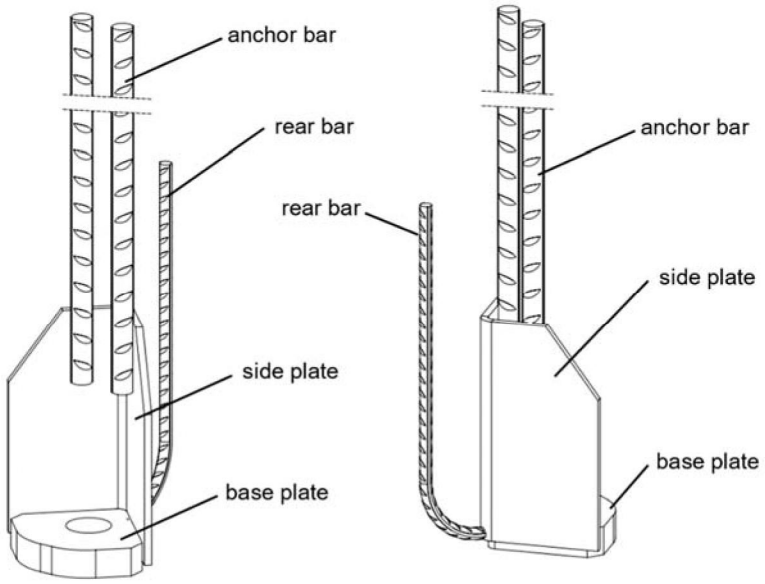

Figure 1. Illustration of HPKM column shoe.

2 Specification of the intended uses in accordance with the applicable European Assessment Document, EAD

2.1 Intended uses

The column shoes serve as connectors between a concrete column and foundation or between two columns. They are inserted inside the hoop reinforcement at the lower end of a column before concreting. After hardening of the concrete the column is installed in its final position. The column shoes are fixed with nuts and washers to carbon steel anchor bolts that have previously been concreted to the supporting lower structure. The space between the end of the column and the supporting structure as well as the recesses for the nuts are grouted with non-shrink grout or concrete.

The following limitations apply:

- The grade of the concrete used for the column shall be in the range C30/37 to C70/85 in accordance with *EN 206*
- Connections by using anchor bolts with an ETA according to EAD 330924 or with anchor bolts designed according to EN 1992 and EN 1993
- Connections designed according to TR 068
- Connections subjected to external atmospheric exposure or exposure in internal conditions including permanently damp conditions. Particularly aggressive conditions, e.g. marine or chemical pollution are excluded
- Connections subjected to static or quasi-static loading
- The column shoe connections are used where the column is horizontally supported by foundation, floor or a set of beams (sway frames included)
- The lowest temperature in use is -20 °C.

The provisions made in this European Technical Assessment are based on an assumed intended working life of the HPKM column shoes of 50 or 100 years[1].

This European Technical Assessment is based on the assumption that all plans needed have been made correctly according to the regulations valid on the building site. Special design rules are presented in TR 068.

It is the responsibility of the manufacturer to ensure that proper information for the use of the column shoes is enclosed to each delivery, including general guidance on the basis of this ETA and the specific installation instructions and construction details. With regard to the assumed working life regular maintenance is necessary. The manufacturer shall provide with written documents which contain descriptions about type and frequency of the maintenance.

The completed building (the works) shall comply with the building regulations (regulations on the works) applicable in the Member States in which the building is to be constructed. The procedures foreseen in the Member State for demonstrating compliance with the building regulations shall also be followed by the entity held responsible for this act. An ETA for the HPKM column shoes does not amend this process in any way.

[1] This means that it is expected that when this working life has elapsed, the real working life may be, in normal use conditions, considerably longer without major degradation affecting the essential requirements of the works. The indications given as to the working life of Column shoes cannot be interpreted as a guarantee given by the producer or the assessment body. They should only be regarded as a means for the specifiers to choose the appropriate criteria for Column shoes in relation to the expected, economically reasonable working life of the works.

3 Performance of the product and references to the methods used for its assessment

Table 1. Basic requirements for construction works and essential characteristics

Basic requirement and essential characteristics	Performance
BWR 1. Mechanical resistance and stability	
Bending stiffness of connection	Clause 3.1
Bending resistance of connection	Clause 3.1
Shear resistance of connection	Clause 3.1
BWR 2. Safety in case of fire	
Reaction to fire	Clause 3.2
Resistance to fire	Clause 3.2

3.1 Mechanical resistance and stability, BWR 1

Bending stiffness of connection

The stiffness factor η_d and the experimental factor k_L that takes into account the effective length of the column are given in Annex 3.

Bending resistance of connection

The bending resistance shall be assessed according to TR design. The stiffness factor shall be used for the calculation of the bending resistance.

Shear resistance of connection

The calibration factor for the shear resistance k_s is given in Annex 3.

3.2 Safety in case of fire, BWR 2

Reaction to fire

The column shoe is considered to satisfy the requirements for performance Class A1.

Resistance to fire

The temperatures to be used in fire design in accordance with the relevant Eurocodes are given in Annex 3.

4 Assessment and verification of constancy of performance (hereinafter AVCP) system applied, with reference to its legal base

For the products covered by this EAD the applicable European legal act is 2000/606//EC The system is 2+.

5 Technical details necessary for the implementation of the AVCP system, as provided for in the applicable EAD.

Technical details necessary for the implementation of the AVCP system are laid down in the control plan deposited at Eurofins Expert Services Oy.

Issued in Espoo on November 15, 2018
by Eurofins Expert Services Oy

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ANNEX 1
THE MATERIAL PROPERTIES OF THE PRODUCT

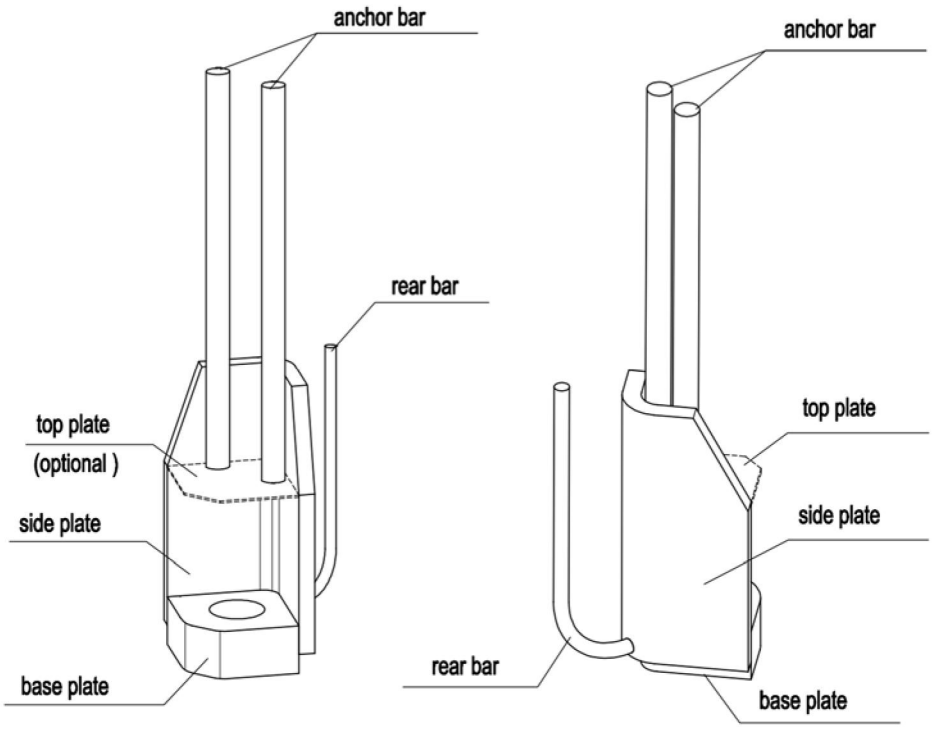

Figure 1. Illustration of HPKM column shoe

Table 1. Materials. The steel plates and the the fillet material shall meet the requirements of EN 10025.

Component	Steel	Optional Steel	Standards
Base plate Side plate Top plate (optional) Main anchor bars Rear bar	S355J2+N S355J2+N S235JR Table 2 Table 2	S355K2+N; S420J2+N S355K2+N; S420J2+N DC01	EN 10025 EN 10025 EN 10025, EN 10130

Table 2. Minimum requirements for reinforcing steel.

General	All requirements set in EN 10080 and EN 1992-1-1, Annex C for the reinforcing steel of Class B or Class C, strength class 500 MPa
Additional	The steel shall be weldable

ANNEX 2
ANCHOR BOLTS AND MINIMUM CONCRETE SECTIONS

Table 3. Anchor bolts and minimum concrete sections for HPKM column shoes.

Column shoe	Anchor bolt	Minimum section [mm x mm]
HPKM 16	HPM 16	230 x 230
HPKM 20	HPM 20	240 x 240
HPKM 24	HPM 24	250 x 250
HPKM 30	HPM 30	280 x 280
HPKM 39	HPM 39	360 x 360

The geometry and tolerances of HPKM column shoes are specified in the Control Plan.

ANNEX 3
CHARACTERSITICS OF THE PRODUCT

Table 4. Essential characteristics of the product

HPKM Column Shoe Types	All types	All types
Mechanical resistance and stability		
Factor of effective length	k_L	1,00
Bending Resistance	η_d	0,90
Shear Resistance	k_s	1,00
Safety in case of fire		
Reaction to fire	*Class (A1)*	
Fire resistance	$T_{cr}(ti)$ *[°C]*	*See below Table 5*

Table 5. Average temperature T [ºC] in critical section of anchor bolt.

Time means the time from the beginning of standard fire exposure.

Time [min]	**HPKM 16**	**HPKM 20**	**HPKM 24**	**HPKM 30**	**HPKM 39**
60	500	500	450	430	390
90	670	610	630	630	570
120	800	780	740	730	700