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MEMBER OF EOTA

European Technical Assessment ETA-13/1063 of 2014/01/16

I General Part

Technical Assessment Body issuing the ETA and designated according to Article 29 of the Regulation (EU) No 305/2011: ETA-Danmark A/S

Trade name of the construction product:

Gutzeit Post bases

Product family to which the above construction product belongs:

EC PAC 13: Three-dimensional nailing plate (Post bases for the support of timber columns and posts as load-bearing elements)

Manufacturer:

Gutzeit Verbindungssysteme GmbH & Co.
Rudolf-Diesel-Strasse 1
D-58730 Fröndenberg, Industriegebiet
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Manufacturing plant:

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This European Technical Assessment contains:

41 pages including 2 annexes which form an integral part of the document

This European Technical Assessment is issued in accordance with Regulation (EU) No 305/2011, on the basis of:

Guideline for European Technical Approval (ETAG) No. 015 Three Dimensional Nailing Plates, April 2013, used as European Assessment Document (EAD).

This version replaces:

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II SPECIFIC PART OF THE EUROPEAN TECHNICAL ASSESSMENT

1 Technical description of product and intended use

Technical description of the product

The post bases are made from 4.0 mm to 8.0 mm thick steel plates in combination with reinforcing bars, threaded rods or steel tubes. The post bases are produced from steel grade S235JR according to EN 10025-2:2005 with minimum characteristic yield strength of $R_e = 235 \text{ N/mm}^2$ and minimum characteristic tensile strength of $R_m = 360 \text{ N/mm}^2$. The reinforcing bars are produced from steel grade B500A according to EN 10080:2005 with minimum characteristic yield strength of $R_{eH} = 500 \text{ N/mm}^2$.

For the connections with metal fasteners nails $\varnothing 4,0 \times 40$ according to EN 14592, dowels and bolts $\varnothing 10$, $\varnothing 12 \text{ mm}$ (S235) and coach screws $\varnothing 8,0$, $\varnothing 10,0$ and $\varnothing 12,0 \text{ mm}$ according to EN 14592 (DIN 571 and thread according to DIN 7998) are used.

Dimensions are shown in Annex A and B.

2 Specification of the intended use in accordance with the applicable EAD

The intended use of the post bases is the support of timber columns and posts as load-bearing elements, where requirements for mechanical resistance and stability and safety in use in the sense of the Basic Works Requirements 1 and 4 of Regulation (EU) 305/2011 shall be fulfilled.

The static and kinematical behaviour of the timber members or the supports shall be as described in Annex B.

The timber posts may be of solid timber of strength class C24 or better according to EN 338:2009. Minimum dimensions for the post have to be considered (Annex A).

The post base shall be installed as pictured in the drawings. The cross-section of the timber column shall be positioned centrally and with the end grain plane on the base plate. Post bases type H may have a clearance between the end grain of the timber post and the base plate of the post base due to constructive wood preservation (maximum 10 mm).

The maximum distance between the foundation and the base plate of the post base is given in Annex A, table A.1.

Annex B states the load-carrying capacities of the post bases for solid timber of strength class C24 according to EN 338:2009. The design of the connections shall be in accordance with Eurocode 3 and Eurocode 5 or a similar national code. The anchorage of the post base in the foundation and imperfections exceeding the assumptions in Eurocode 5, 5.4.4 are not part of this ETA.

The post bases are for use in timber structures subject to the service classes 1, 2 and 3 of Eurocode 5 and for connections subject to static or quasi-static loading. The corrosion protection is given by hot-dip zinc coating with a minimum thickness of 55 μm according to EN 1461 or zinc coating Fe/Zn 25c according to EN ISO 2081. The metal fasteners must also have a zinc coating for the intended use in service class 3 of EN 1995-1-1 (zinc coating Fe/Zn 25c according to EN ISO 2081).

The scope of the post bases regarding resistance to corrosion shall be defined according to national provisions that apply at the installation site considering environmental conditions.

The provisions made in this European Technical Assessment are based on an assumed intended working life of the post bases of 50 years.

The indications given on the working life cannot be interpreted as a guarantee given by the producer or Assessment Body, but are to be regarded only as a means for choosing the right products 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

Characteristic	Assessment of characteristic
3.1 Mechanical resistance and stability*) (BR1)	
Characteristic load-carrying capacity	See Annex B
Stiffness	No performance determined
Ductility in cyclic testing	No performance determined
3.2 Safety in case of fire (BR2)	
Reaction to fire	The hold downs are made from steel classified as Euroclass A1 in accordance with EN 1350-1 and EC decision 96/603/EC, amended by EC Decision 2000/605/EC
3.3 Hygiene, health and the environment (BR3)	
Influence on air quality	No dangerous materials
3.7 Sustainable use of natural resources (BR7)	No Performance Determined
3.8 General aspects related to the performance of the product	The post bases have been assessed as having satisfactory durability and serviceability when used in timber structures using the timber species described in Eurocode 5 and subject to the conditions defined by service class 1 and 2
Identification	See Annex A

*) See additional information in section 3.8 – 3.9.

In addition to the specific clauses relating to dangerous substances contained in this European technical Assessment, there may be other requirements applicable to the products falling within its scope (e.g. transposed European legislation and national laws, regulations and administrative provisions). In order to meet the provisions of the Construction Products Regulation, these requirements need also to be complied with, when and where they apply.

3.9 Methods of verification

Safety principles and partial factors

The characteristic load-carrying capacities are based on the characteristic values of the connections with metal fasteners, the steel plates and the timber post.

In the case of timber failure or failure of the metal fasteners, the design values shall be calculated according to EN 1995-1-1 by dividing the characteristic values of the load-carrying capacities by different partial factors for the strength properties, and in addition multiplied with the coefficient k_{mod} .

In the case of steel failure, the design value shall be calculated according to EN 1993-1-1 by reducing the characteristic values of the load-carrying capacity with different partial factors.

The design value of the load-carrying capacity is the smaller value of all load-carrying capacities:

$$F_{Rd} = \min \left\{ \frac{k_{mod} \cdot F_{Rk,T}}{\gamma_{M,T}}; \frac{F_{Rk,S}}{\gamma_{M,S}} \right\}$$

Therefore, for timber failure or failure of the metal fasteners the load duration class and the service class are included. The different partial factors γ_M for steel or timber failure, respectively, are also correctly taken into account.

3.10 Mechanical resistance and stability

See Annex B for the characteristic load-carrying capacity in the different directions F_1 to F_5 for solid timber of strength class C24 according to EN 338:2009. Using the load-carrying capacities of the post bases, the specifications in Annex A must be fulfilled. The end grain of the timber post must in general be plane on the base plate of the post base. Post bases type H may have a clearance between the end grain of the timber post and the base plate of the post base due to constructive wood preservation (maximum 10 mm).

The characteristic capacities of the post bases are determined by calculation according to Eurocode 3 and Eurocode 5. They should be used for designs in accordance with Eurocode 3 and Eurocode 5 or a similar national code.

No performance has been determined in relation to ductility of a joint under cyclic testing. The contribution to the performance of structures in seismic zones, therefore, has not been assessed.

No performance has been determined in relation to the joint's stiffness properties - to be used for the analysis of the serviceability limit state.

No performance has been determined in relation to the anchorage of the post bases in the foundation. It must be checked by the designer of the structure to ensure it is not less than the post base capacity and, if necessary, the post base capacity reduced accordingly. Therefore the specifications for the lever arms $e_{F2/F3}$ (for load case F_2 / F_3) and $e_{F4/F5}$ (for load case F_4 / F_5) in annex A have to be considered. The lever arm is the distance between the top edge of the foundation and the load.

3.11 Aspects related to the performance of the product

3.11.1 Corrosion protection in service class 1, 2 and 3.

The post bases are produced from steel grade S235JR according to EN 10025-2:2005 with minimum characteristic yield strength of $R_e = 235 \text{ N/mm}^2$ and minimum characteristic tensile strength of $R_m = 360 \text{ N/mm}^2$. The reinforcing bars are produced from steel grade B500A according to EN 10080:2005 with minimum characteristic yield strength of $R_{eH} = 500 \text{ N/mm}^2$

The corrosion protection is given by hot-dip zinc coating with a minimum thickness of $55 \mu\text{m}$ according to EN 1461 or zinc coating Fe/Zn 25c according to EN ISO 2081. The metal fasteners must also have a zinc coating for the intended use in service class 3 of EN 1995-1-1 (zinc coating Fe/Zn 25c according to EN ISO 2081).

3.12 General aspects related to the fitness for use of the product

The hold downs are manufactured in accordance with the provisions of this European Technical Assessment using the manufacturing processes as identified in the inspection of the plant by the notified inspection body and laid down in the technical documentation

The nailing pattern used shall be either the maximum or the minimum pattern as defined in Annex A.

The following provisions apply:

The timber post

- shall be restrained against rotation, and supported at the lower and upper end
- shall be strength class C24 according to EN 338:2009 or better, see section 3 of this evaluation report
- shall be free from wane in the post base

- must fulfil the requirements regarding minimum dimensions (see Annex A)
- end grain must in general be plane on the base plate of the post base; post bases type H may have a distance between the end grain of the timber post and the base plate of the post base due to constructive wood preservation (maximum 10 mm)

The post base shall be installed centrally in the cross-section of the timber column.

The actual end bearing capacity of the timber member to be used in conjunction with the post base is checked by the designer of the structure to ensure it is not less than the post base capacity and, if necessary, the post base capacity reduced accordingly.

There are no specific requirements relating to preparation of the timber members.

The anchorage of the post base in the foundation is not part of this ETA. It must be checked by the designer of the structure to ensure it is not less than the post base capacity and, if necessary, the post base capacity reduced accordingly. Therefore the specifications for the lever arms $e_{F2/F3}$ (for load case F2 / F3) and $e_{F4/F5}$ (for load case F4 / F5) in Annex A have to be considered. The lever arm is the distance between the top edge of the foundation and the load.