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Authorised and notified according to Article 10 of the Council Directive 89/106/EEC of 21 December 1988 on the approximation of laws, regulations and administrative provisions of Member States relating to construction products

MEMBER OF EOTA

## European Technical Approval ETA-10/0010

*This ETA replaces the previous ETA with the same number and validity from 2010-01-26 to 2015-01-26*

<b>Trade name:</b>	GH Angle brackets and hold-downs*)
<b>Holder of approval:</b>	GH Baubeschläge GmbH Austrasse 34 D-73235 Weilheim / Teck Tel.: +49 7023 7433 23-11 Telefax: +49 7023 7433 23-29 Internet: <a href="http://www.holzverbinder.de">www.holzverbinder.de</a>
<b>Generic type and use of construction product:</b>	Angle brackets and hold-downs for timber-to-timber or timber-to-concrete or steel connections
<b>Valid from:</b> <b>to:</b>	2010-05-21 2015-01-26
<b>Manufacturing plant:</b>	GH Baubeschläge GmbH Austrasse 34 D-73235 Weilheim / Teck

**This European Technical Approval contains:**

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

\*) See section II.1 of this ETA for details



European Organisation for Technical Approvals

Europæisk Organisation for Tekniske Godkendelser

## I LEGAL BASIS AND GENERAL CONDITIONS

- 1 This European Technical Approval is issued by ETA-Danmark A/S in accordance with:
- Council Directive 89/106/EEC of 21 December 1988 on the approximation of laws, regulations and administrative provisions of Member States relating to construction products<sup>1)</sup>, as amended by Council Directive 93/68/EEC of 22 July 1993<sup>2)</sup>.
  - Bekendtgørelse 559 af 27-06-1994 (afløser bekendtgørelse 480 af 25-06-1991) om ikrafttræden af EF direktiv af 21. december 1988 om indbyrdes tilnærmelse af medlemsstaternes love og administrative bestemmelser om byggevarer.
  - Common Procedural Rules for Requesting, Preparing and the Granting of European Technical Approvals set out in the Annex to Commission Decision 94/23/EC<sup>3)</sup>.
  - EOTA Guideline ETAG 015 *Three-dimensional nailing plates*, September 2002 edition.
- 2 ETA-Danmark A/S is authorized to check whether the provisions of this European Technical Approval are met. Checking may take place in the manufacturing plant. Nevertheless, the responsibility for the conformity of the products to the European Technical Approval and for their fitness for the intended use remains with the holder of the European Technical Approval.
- 3 This European Technical Approval is not to be transferred to manufacturers or agents of manufacturers other than those indicated on page 1, or manufacturing plants other than those indicated on page 1 of this European Technical Approval.
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- 6 This European Technical Approval is issued by ETA-Danmark A/S in English. This version corresponds fully to the version circulated within EOTA. Translations into other languages have to be designated as such.

1) Official Journal of the European Communities N° L40, 11 Feb 1989, p 12.  
2) Official Journal of the European Communities N° L220, 30 Aug 1993, p 1.  
3) Official Journal of the European Communities N° L 17, 20 Jan 1994, p 34.

## II SPECIAL CONDITIONS OF THE EUROPEAN TECHNICAL APPROVAL

### 1 Definition of product and intended use

#### Definition of the product

The following types are covered by the assessment:

GH angle brackets and hold-downs

type HB 155x50x40x3,0

type HSB 200x40x40x2,0; 200x40x40x4,0;  
200x40x40x2,0; 300x40x40x4,0;  
400x40x40x2,0; 400x40x40x4,0

Hold-downs 500x40x40x2,0; 500x40x40x4,0;  
600x40x40x2,0; 600x40x40x4,0

Hold-downs 340x180x40x2,0; 400x120x40x3,0;  
420x220x60x2,0; 420x100x60x2,0;  
480x120x60x2,5

Hold-downs

TopVario 240x120x55x2,0; 280x120x55x2,0  
with washer 40x43x10,0; 160x50x15,0; 110x60x15,0;  
200x60x20,0; 85x60x20,0; 115x70x20,0;  
114x55x20,0

Hold-downs GH HT16 -60/340; GH HT 22 – 60/440;  
GH HT 28 – 60/540; GH HT 30 – 80/420;  
GH HT 32 – 80/520; GH HT 34 – 80/620  
with washer 56x52x10,0; 77x72x20,0

GH angle brackets or hold-downs, respectively, are one-piece non-welded, face-fixed angle brackets to be used in timber to timber or in timber to concrete or to steel connections. They are connected to construction members made of timber or wood-based products with profiled (ringed shank) nails or screws according to EN 14592 and to concrete or steel members with bolts or metal anchors.

The angle brackets with a steel plate thickness of 2 mm to 4 mm are made from pre-galvanized steel S250 GD / Z 275 according to EN 10326:2004, or steel grade DX 51 D / Z 275 according to EN 10327:2004 with  $R_c \geq 250 \text{ N/mm}^2$ ,  $R_m \leq 360 \text{ N/mm}^2$  and  $A_{80} \geq 19\%$ . Dimensions, hole positions and typical installations are shown in Annex A and B. GH angle brackets are made from steel with tolerances according to EN 10143.

#### Intended use

The angle brackets are intended for use in making connections in load bearing timber structures, as a connection between a column or a purlin and a concrete or steel member, where requirements for mechanical resistance and stability and safety in use in the sense of the Essential Requirements 1 and 4 of Council Directive 89/106/EEC shall be fulfilled.

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

The wood members may be of solid timber, glued laminated timber and similar glued members, or wood-based structural members with a characteristic density from  $290 \text{ kg/m}^3$  to  $420 \text{ kg/m}^3$ . This requirement to the material of the wood members can be fulfilled by using the following materials:

- Structural solid timber classified to C14-C40 according to EN 338 / EN 14081,
- Glulam classified to GL24-GL36 according to EN 1194 / EN 14080,
- LVL according to EN 14374,
- Parallam PSL,
- Intrallam LSL,
- Duo- and Triobalken,
- Layered wood plates,
- Plywood according to EN 636

Annex B states the load-carrying capacities of the angle bracket connections for a characteristic density of  $350 \text{ kg/m}^3$ . For timber or wood based material with a lower characteristic density than  $350 \text{ kg/m}^3$  the load-carrying capacities shall be reduced by the  $k_{\text{dens}}$  factor:

$$k_{\text{dens}} = \left( \frac{\rho_k}{350} \right)^2$$

Where  $\rho_k$  is the characteristic density of the timber in  $\text{kg/m}^3$ .

The design of the connections shall be in accordance with Eurocode 5 or a similar national Timber Code. The wood members shall have a thickness which is larger than the penetration depth of the fasteners into the members.

The angle brackets are primarily for use in timber structures subject to the dry, internal conditions defined by service classes 1 and 2 of Eurocode 5 and for connections subject to static or quasi-static loading. The angle brackets may also be used in outdoor timber structures, service class 3, when a corrosion protection in accordance with Eurocode 5 is applied, or when stainless steel with similar or better characteristic yield and ultimate strength is employed. If a stainless steel with a lower characteristic yield or ultimate strength is employed, the load-carrying capacities  $F_{m,Rk}$ ,  $F_{v,Rk}$  or  $F_{t,Rk}$  in Tables 1 and 2 (see annex B) are to be reduced proportionally.

The angle brackets may also be used for connections between two timber members.

#### Assumed working life

The assumed intended working life of angle brackets or hold-downs for the intended use is 50 years, provided that they are subject to appropriate use and maintenance.

The information on the working life should not be regarded as a guarantee provided by the manufacturer or ETA Denmark. An "assumed intended working life" 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.