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European Technical Assessment ETA 24/0033
of 12/02/2024

I General Part

Technical Assessment Body issuing the ETA	Eurofins Expert Services Oy
Trade name of the construction product	BREKAR angle brackets
Product family to which the construction product belongs	Three-dimensional nailing plates
Manufacturer	**BREKAR SAS** 1 Impasse Dorothée Le Maitre 77700 SERRIS FRANCE
Manufacturing plant	BREKAR plant 02
This European Technical Assessment contains	75 pages including 2 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 130186-00-0603 for Three-dimensional nailing plates

II Specific Part

1 Technical description of the product

BREKAR angle brackets are one-piece non-welded three-dimensional nailing plates manufactured from hot-dip zinc coated steel sheet of grade S250 GD Z 275 MA according to EN 10346 or SS GR340 Z275 according to ASTM A653M or from cold rolled austenitic stainless steel plate of grade 1.4301 according to EN 10088-2 or AISI 304 (SS304) according to ASTM A240/A240M.

Figure 1. Examples of BREKAR angle brackets. Flanges A and B marked.

In the zinc coated connectors, the yield strength R_{el} or R_{02} of the steel is at least 250 N/mm², the tensile strength R_m at least 330 N/mm² and elongation at failure A_{80} at least 19 %. Amount of the zinc coating is at least 275 g/m^2. In stainless steel connectors, the yield strength R_{02} of the steel is at least 230 N/mm², the tensile strength R_m at least 520 N/mm² and the elongation at failure A_{80} at least 45 %.

The product drawings are in Annex 1 and the sizes of BREKAR angle brackets are listed in tables of Annex 2. The steel material thickness of the zinc coated connectors is 2,00 ± 0,14 mm, 2,50 ± 0,16 mm or 3,00 ± 0,18 mm. The material thickness of stainless steel connectors is 2,00 ± 0,10 mm; 2,50 ± 0,12 mm or 3,00 ± 0,14 mm. Tolerance for the position of the holes is within ± 1,00 mm.

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

2.1 Intended uses

Intended use of BREKAR angle brackets are timber constructions, where both flanges of the bracket are fixed to strength graded timber according to EN 14081-1, glulam according to EN 14080, softwood- or laminated logs, laminated veneer lumber (LVL) according to EN 14374, plywood according to EN 13986, cross laminated timber (CLT) with edge glued lamellas, or corresponding timber material. The characteristic density ρ_k of the timber shall not be greater than 500 kg/m³. This ETA does not cover angle brackets fixed in the end of a timber member or in the edge of a LVL member.

The forces to be transferred by the angle bracket shall act at the centre of the fastener group on the plane defined by flange A. For non-symmetric connections, the flange A means always the bigger flange. For unclear cases, the flange A is presented in figures of Appendix 1. Shear capacity represents the force component that is in effect in direction of a flange surface. Tensile and compression force are the force components that are in effect in direction perpendicular to a flange surface. The long adjustable hole brackets J-LAB-100 and J-LAB-130 are used typically for fixing non-settling construction members to a log wall and they may be loaded only by tension loads. The log bracket named J-LBJ-160 is a two-part connector used as a wind uplift restraint.

BREKAR angle brackets shall be fixed to timber by anchor nails or anchor screws (see Figure 2) according to EN 14592. The diameter of the anchor nails shall be d = 4,0 mm and the profiled length at least 24 mm. The anchor screw shall have a conical head, the diameter of the smooth part of the screw shall be d = 4,5…5,0 mm and the inner diameter of the threaded part $d_1 \geq$ 3,0 mm. The length of the threaded part of the screw shall be at least 6d.

a)

b)

Figure 2. Fasteners: a) anchor nail and b) anchor screw.

Connections with BREKAR angle brackets shall fulfil the minimum spacing and edge distance requirement specified in EN 1995-1-1. Timber parts shall not be pre-drilled for the nails or screws. Fasteners shall be perpendicular to the grain of the timber.

For BREKAR angle brackets made of hot-dip zinc coated steel, the intended service classes according to EN 1995-1-1 are classes 1 and 2. Angle brackets made of stainless steel can also be used in service class 3.

In service class 2, the nails or screws shall have an electroplated zinc coating according to EN ISO 2081 at least of type and thickness Fe/Zn 12c, or they shall be hot dip zinc coated according to EN ISO 1461, thickness at least 39 μm. In service class 3, the nails or screws shall be made of stainless steel.

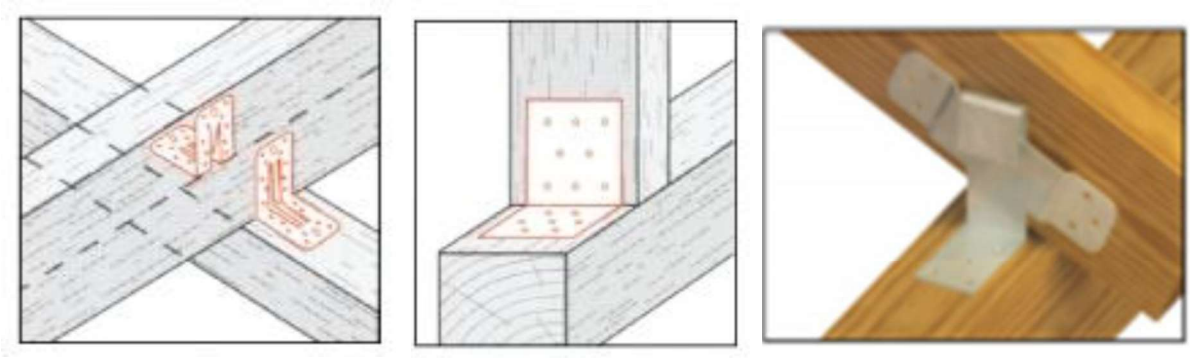

Figure 3. Typical use of BREKAR angle brackets.

2.2 Working life

The provisions made in this European Technical Assessment are based on an assumed intended working life of the angle brackets of 50 years.[1]

2.3 Identification

BREKAR angle brackets are identified having "BKR" stamped on each connector.

[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 a product 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 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

Table 1. Basic requirements for construction works and essential characteristics

Basic requirement and essential characteristics	Performance
BWR 1. Mechanical resistance and stability	
Joint strength	Clause 3.1
Joint stiffness	No performance assessed
Joint ductility	No performance assessed
Resistance to corrosion and deterioration	Clause 3.1
Dimensional stability	No performance assessed
BWR 2. Safety in case of fire	
Reaction to fire	Clause 3.2
Resistance to fire	No performance assessed

3.1 Mechanical resistance and stability, BWR 1

3.1.1 Joint strength

Characteristic resistance values of BREKAR angle brackets are given in Annex 2.

3.1.2 Resistance to corrosion and deterioration

BREKAR angle brackets have been assessed as having satisfactory durability and serviceability when used in timber structures when the timber species (including timbers preserved with organic solvent, boron diffusion and related preservatives) described in Eurocode 5 (EN 1995-1-1:2004) are used and the structures are subject to the dry, internal conditions defined by service classes 1 and 2. Angle brackets manufactured from stainless steel can also be used in service class 3 provided that also the nails and screws used together with them are made of stainless steel.

3.2 Safety in case of fire, BWR 2

3.2.1 Reaction to fire

BREKAR angle brackets are made of materials classified to have reaction to fire class A1 according to EN 13501-1.

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

According to the Decision 97/638/EC of the European Commission[2], the system of assessment and verification of constancy of performance (see Annex V to the regulation (EU) No 305/2011) is System 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.

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[2] Official Journal of the European Communities L 268 of 1/10/1997