

PRODUCT DECLARATION BY THE CONCRETE ASSOCIATION OF FINLAND

TYPE 5B - EC 2 FASTENING ITEM

number

152

Representative for the fastening item in Finland: **Peikko Finland Oy**
P.O. Box 104 (visiting address Voimakatu 3), 15101 LAHTI

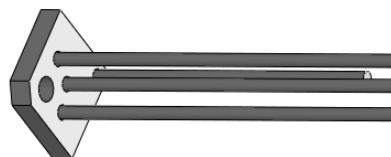
Manufacturer of the fastening item: **Peikko Group Oy**

Type and identification of the fastening item: **BECO® Beam Shoes:**
BECO 16H BECO 20H BECO 24H BECO 30H BECO 39H
BECO 30P BECO 36P BECO 39P BECO 45P BECO 52P

Figure of the fastening item



BECO 16H, BECO 20H, BECO 24H,
BECO 30H, BECO 39H
BECO 30P, BECO 36P



BECO 39P, BECO 45P, BECO 52P

Function principle of the fastening item:

BECO® Beam Shoes are steel products used in precast concrete beams to create moment-resisting connections between precast concrete columns and beams along with anchoring couplers or anchor bolts.

DECISION OF SUOMEN BETONIYHDISTYS ry. (THE CONCRETE ASSOCIATION OF FINLAND)

Suomen Betoniyhdistys ry. (the Concrete Association of Finland) has processed this product declaration and has approved it based on the available documentation. The declaration provides sufficient explanation of the properties and matters related to the usage of the fastening item, which is intended for concrete structures, provided that planning is based on Eurocode standards and relevant national annexes.

When the fastening item is used, both the product declaration and the following points should be taken into consideration:

1. A valid product declaration for the fastening item, as granted by the Concrete Association of Finland, must be available on the manufacturing site.
2. A product declaration for the fastening item, as granted by the Concrete Association of Finland, must be available on the construction site, along with the product's user manual.
3. Usage areas for the fastening item.

This product declaration is valid until **September 25, 2027**, in the absence of any information that would represent grounds for the declaration to be withdrawn.

Two original copies of this declaration have been made, one of which is stored at the offices of the Concrete Association of Finland.

Helsinki October 4, 2022

Suomen Betoniyhdistys ry. (The Concrete Association of Finland)

A handwritten signature in black ink.

Markku Leivo
Chair

A handwritten signature in blue ink.

Mirva Vuori
Managing Director

The Concrete Association of Finland is an independent technoscientific association that promotes the correct use of concrete. Its members are active in an extensive range of concrete construction areas. The association publishes technical instructions, participates in certifying personal competencies in the concrete sector, organizes training and members' events, initiates and steers development projects, and provides consulting services to the Ministry of the Environment.

Applications for product declarations from the Concrete Association of Finland are processed by the Association's divisions, which contain independent experts who are nominated by the Association's board. Product declarations are intended for responsible professionals in the construction sector who are able to appropriately apply the guidance provided in the product declarations on construction sites and who can understand the restrictions related to product usage while taking responsibility for applying them to their own work.

INFORMATION PROVIDED BY THE MANUFACTURER OR REPRESENTATIVE OF THE FASTENING ITEM:

1. Operation of the fastening item

BECO® Beam Shoes are used with anchoring couplers or anchor bolts to transfer normal forces.

2. Manufacture of the fastening item

21 Components:

- Bottom plate
- Recess box
- Anchoring bars

22 Manufacturing method

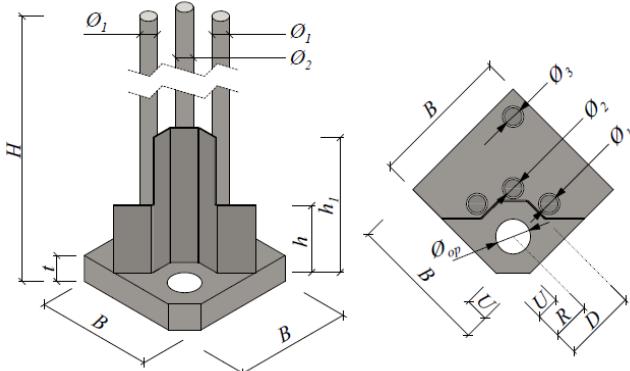
Bottom plates	Thermal cutting and hole drilling
Recess box	Mechanical cutting, bending, and welding
Anchoring bars	Mechanical cutting and welding

23 Welding

Manual and robot welding:	135 MAG welding with solid wire electrode, 138 MAG welding with metal cored electrode (SFS-EN ISO 4063)
	Quality level C (SFS-EN ISO 5817)

3. Dimensions, tolerances, and coating of fastening parts

31 Dimensions [mm], weights [kg] and color codes



Beam Shoe	BECO® 16H	BECO® 20H	BECO® 24H	BECO® 30H	BECO® 39H	BECO® 30P	BECO® 36P	BECO® 39P	BECO® 45P	BECO® 52P
<i>B</i>	115	125	140	150	190	160	200	225	260	290
<i>H</i>	930	1085	1225	1625	2250	1850	2330	2105	2400	3140
<i>t</i>	15	20	25	35	45	40	50	50	60	80
<i>R</i>	50	50	50	50	60	50	60	60	60	60
<i>U</i>	30	30	30	30	37	30	37	37	37	37
<i>D</i>	80	80	85	90	115	90	110	115	125	130
<i>h</i>	80	90	90	100	130	100	110	130	125	150
<i>h1</i>	145	160	165	185	225	185	215	225	245	295
<i>O₁</i>	12	16	20	25	32	28	32	28	32	40
<i>O₂</i>	-	-	-	-	-	-	-	28	32	32
<i>O₃</i>	10	12	16	20	28	20	28	28	32	32
<i>O_{op}</i>	27	30	35	40	55	40	50	55	60	70
Weight	3.5	6.2	10.3	19.6	43.9	27.0	47.2	52.0	79.6	133.3
Color code*	Yellow	Blue	Gray	Green	Orange	Black	Red	Brown	Purple	White

32 Tolerances

Tolerance class C, SFS-EN ISO 13920

Anchor bars: length ± 10 mm

Bolt hole: size $+2 / -0$ mm, position ± 1 mm

Anchor bar holes: size $+1 / -0$ mm, position ± 0.5 mm

33 Coatings

Standard BECO® Beam shoes are delivered with a color-coded undercoating (40 µm) on the base surface of the bottom plate. Special orders can be made for epoxy coating or hot-dip galvanizing for example.

4. Properties of the fastening item's materials (standards, strength values, composition, weldability)

Part:	Materials:	Standards:
Bottom plate	S355J2+N	EN 10025-2
Recess box	S235JR	EN 10025-2
Ribbed bars	B500B	EN 10080, SFS 1300

5. Labeling, packaging methods, and storage of the fastening items

Labeling: The product has a sticker with

- The name of the manufacturer
- FI certificate label
- Product code, type, and number
- Date of manufacture

Packaging:

The products are packed on pallets.

Storage:

The products are stored indoors.

6. Requirements regulating the concrete structures

61 Strength class and special characteristics of concrete and grout

The design value resistances of BECO® Beam Shoes have been calculated for concrete strength class C30/37 in good bonding conditions using the partial safety factors defined in Annex A of the standard SFS-EN 1992-1-1 and the national annex of Finland.

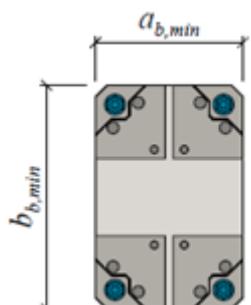
62 Aggregate quality

The aggregate quality must be in accordance with the standard SFS-EN 12620 'Aggregates for concrete'.

63 Minimum edge distances and spacing required by the procedure

Minimum dimensions of concrete beams:

Beam	BECO 16H	BECO 20H	BECO 24H	BECO 30H	BECO 39H	BECO 30P	BECO 36P	BECO 39P	BECO 45P	BECO 52P
$a_{b,min}$	240	260	290	310	390	330	410	460	530	590
$b_{b,min}$	240	260	290	310	390	330	410	460	530	590



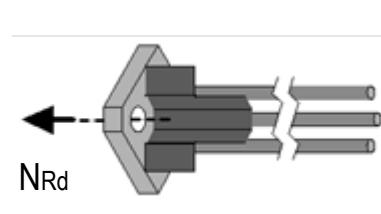
64 Nominal concrete cover

Thickness of concrete cover is determined according to the requirements regarding fire resistance, environmental exposure class, and planned service life contained in standards SFS-EN 206, SFS-EN 1992-1-1, SFS-EN 1992-1-2 and the national annex of Finland.

7. Resistances (Table)

Design value resistances of individual BECO® Beam Shoes for concrete grade C30/37:

Beam shoe	N_{Rd} [kN]
BECO 16H	62
BECO 20H	96
BECO 24H	139
BECO 30H	220
BECO 39H	383
BECO 30P	299
BECO 36P	436
BECO 39P	521
BECO 45P	697
BECO 52P	938



8. Installation of the fastening item

BECO® Beam Shoe is installed in between the reinforcement of the beam and fixed to the mold's end plate with bolts through holes in the bottom plate of the beam shoe. The anchor bars are tied to the reinforcement.

9. Special instructions for ensuring adequate fastening

Precast columns and beams must be manufactured in accordance with standards SFS-EN 13225 '*Precast concrete products. Linear structural elements*' and SFS-EN 13369 '*Common rules for precast concrete products*'. The instructions and tolerances given in the Technical Manual must be followed for the positioning and supplementary reinforcement of the beam shoe. The on-site installations must follow the requirements contained in the standard SFS-EN 13670 '*Execution of concrete structures*' and its supplementary standard SFS 5975 as well as the standard SFS-EN 1992-1-1 '*Design of concrete structures*' and the national annex of Finland. The standard SFS-EN 206 needs to be considered in the performance and production of concrete.

The standard parts are manufactured from plates with impact property class 27J. Materials with higher impact strength must be considered in temperatures below -20°C, or further calculations may be needed to verify the resistances.

10. Structural static calculations (Annex number, calculation name, and date)

Annex 3: BECO® Beam Shoes, Static calculation acc. SFS Eurocode, REV01, dated April 1, 2022

11. Acceptance tests performed for the fastening item (Annex number, test body, test report number, and date)

12. Name and publication date of the installation instructions from the manufacturer or representative

Annex 1: BECO®-palkkikenkä, Tekninen käyttöohje, FI 08/2022

13. Quality control

The manufacturer has a valid contract for quality control with an accredited third-party organization. The organization delivers quality control reports to the Concrete Association of Finland. The quality control of welding must follow the requirements contained in the standard SFS-EN ISO 17660-1 '*Welding. Welding of reinforcing steel*'. This Product Declaration by the Concrete Association of Finland requires an approved initial inspection for each manufacturer.

14. Other information

15. Additional information, not public (Annex number, title, and date)

Annex 2: Manufacturing drawings, dated August 30, 2022

Annex 3: BECO® Beam Shoes, Static calculation acc. SFS Eurocode, REV01, dated April 1, 2022

Annex 4: List of manufacturing units, dated July 21, 2022

16 Annexes (annex number, name, and publication date)

Annex: BECO®-palkkikenkä, Tekninen käyttöohje, FI 08/2022
(BECO® Beam Shoe, Technical Manual, FI 08/2022)

We hereby declare that the information that we have provided is correct

September 9, 2022

Signature

Name (in print)

Ville Härkönen

Peikko Finland Oy

This product declaration can be withdrawn at the discretion of the Concrete Association of Finland. Reasons for withdrawal may include:

- The information provided when the application for the product declaration was made is shown to be erroneous
- An unreasonable decrease in quality or repeated minor decreases in quality are observed in the product subject to this product declaration

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Nimi: Ville Härkönen
Sähköposti: ville.harkonen@peikko.com

Allekirjoituksen tyyppi: Sähköinen allekirjoitus
Tunnistamistapa: Sähköposti
Varmenteen haltija: Platform of Trust Oy
Varmenteen liikkeellelaskija: Digi- ja väestötietovirasto

Ville Härkönen

Allekirjoitettu 2022-12-19 14:37:35 (EET)

Nimi: Mirva Vuori
Sähköposti: mirva.vuori@betoniyhdistys.fi
Organisaatio: Suomen Betoniyhdistys ry

Allekirjoituksen tyyppi: Sähköinen allekirjoitus
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Mirva Vuori

Allekirjoitettu 2022-12-19 14:40:18 (EET)

Nimi: Markku Leivo
Sähköposti: leivomarkku@gmail.com

Allekirjoituksen tyyppi: Sähköinen allekirjoitus
Tunnistamistapa: Sähköposti
Varmenteen haltija: Platform of Trust Oy
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asiakaspalvelu@signspace.fi
0600 301 339 (1,52 eur/min+pv, viikonpäivinä 8.00 - 16.00)