TECHNICAL MANUAL

PSB® Headed Anchors

Effective anchorage and easy installation

Version PEIKKO GROUP 07/2024

peikko®

PSB® Headed Anchors

Effective anchorage and easy installation

- Easy and time-saving installation also in highly congested areas
- Wide range of use in any concrete element
- Diameter range of headed rebars from 10 mm to 32 mm
- European Technical assessment ETA 21/0463
- Anchorage capacity of head is adequate to tensile resistance of rebar
- Load transfer under high-cycle fatigue loading.

PSB® Headed Anchor is used for reliable anchorage of rebars into concrete. The head is forged at one or both ends of the rebar. The head allows transferring the full tensile strength of the rebar once casted in concrete. PSB® Headed Anchors allow to optimize the detailing of the reinforcement and reduce reinforcement congestion in joint areas.

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About PSB® Headed Anchors

1. Product properties

PSB® Headed Anchors are round mechanical anchors with diameter ≥3Ø, where Ø is the diameter of the rebar, forged at one or both ends of the rebar and used for anchoring rebars in concrete. The head allows to anchor the full tensile strength of the rebar once it is cast in concrete.

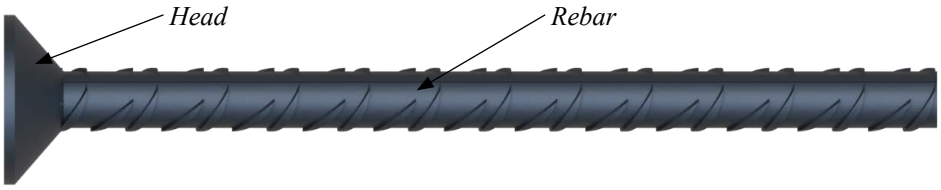
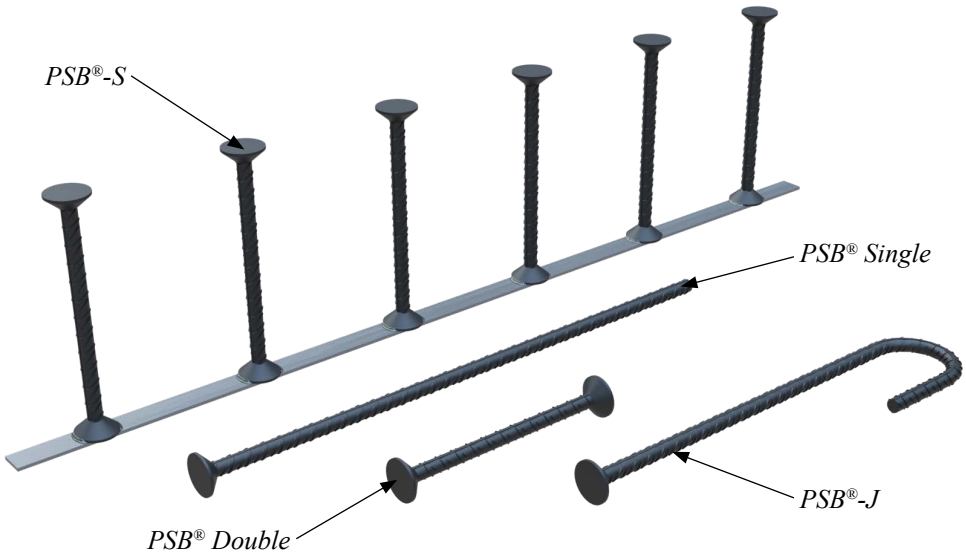


Figure 1. Shape of headed anchor.

Peikko provides four semi-standard models of PSB® Headed Anchors suitable for various applications.



PSB® Single
Headed anchor with forged head at one end.

PSB® Double
Headed anchor with forged heads at both ends.

PSB®-S
Prefabricated assemblies of double-headed anchors.

PSB®-J
Headed anchor with forged head at one end and bent hook at the other end.

1.1 Limitations for application

1.1.1 Loading and environmental conditions

PSB® Headed Anchors are designed to carry static loads or high cycle fatigue loads. The specified properties are guaranteed in concrete structures with minimum concrete strength C30/37.

1.1.2 Positioning of PSB® Headed anchor

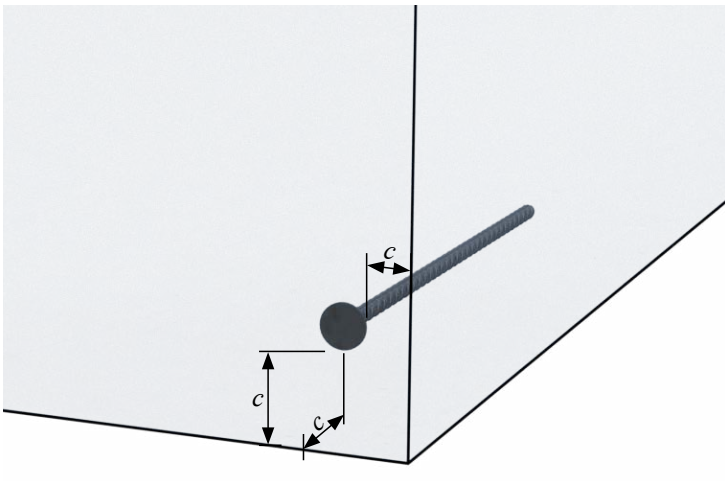


Figure 2. Defined concrete cover of PSB® Headed Anchor.

In case of PSB® Headed Anchors replace reinforcement with the combination of bond and hooks, detailing rules are followed by EN 1992-1-1: 2010, section 8.2. The installation of rebar with PSB® Headed Anchors is executed in accordance with reinforcement drawing, created by designer of the project.

1.2 Other properties

1.2.1 Material

PSB® Headed Anchors are produced from following materials:

Rebar	B500	EN 10080

Other reinforcement materials in accordance with EN 10080, upon request.

2. Resistances

The performance of PSB® Headed Anchors has been assessed by testing. The two essential characteristics are:

Anchorage capacity under static loading – Category B assessed by ETA 21/0463.

PSB® Headed Anchors fulfil the requirements of **category B3:** Without any bond force, the head is capable of anchoring a force corresponding to the tensile strength of the headed rebar. The requirement is considered to be fulfilled if the failure occurs outside of the head area and at least 0.95 $R_{m,act}$ (f_u) is reached by comparing with the actual tensile strength of the rebar $R_{m,act}$ (f_u) from the same batch.

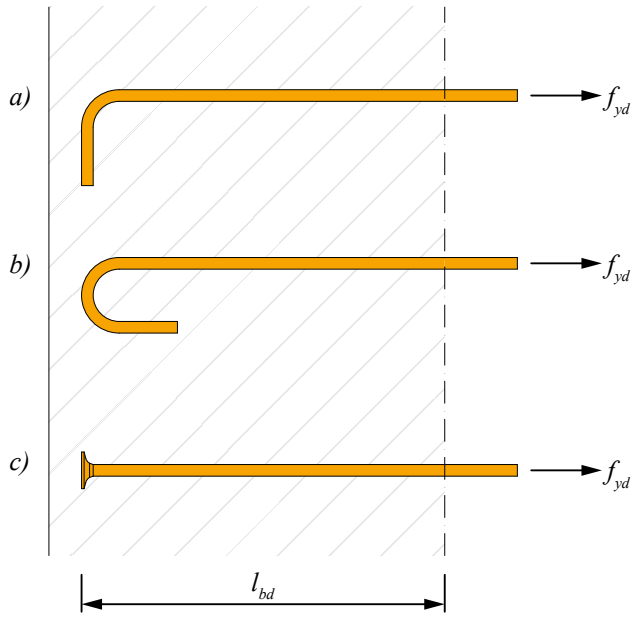
Assessed diameters: Ø10, Ø12, Ø14, Ø16, Ø20, Ø25, Ø28 and Ø32.

Anchorage capacity under high-cycle elastic fatigue loading – Category F assessed by ETA 21/0463.

Category F2: PSB® Headed Anchor under high-cycle fatigue loading fails in reinforcement rebar, outside of the affected zone of forged head. All specimens should fail in the parent rebar outside the affected zone. Performance of PSB® Headed Anchor under high fatigue loading was verified by testing in accordance with EAD 160012-01-0301.

Approved diameters: Ø12, Ø14, Ø16, Ø20 and Ø25.

PSB® Headed Anchors allow to develop the full tensile strength of the rebars once cast into concrete and concrete reaches required strength. The head provides mechanical end anchorage or an alternative to developing reinforcement through the combination of bond and bends/ hooks.



a) rebar with 90-degree hook
b) rebar with 180-degree hook
c) rebar with PSB® Headed Anchor

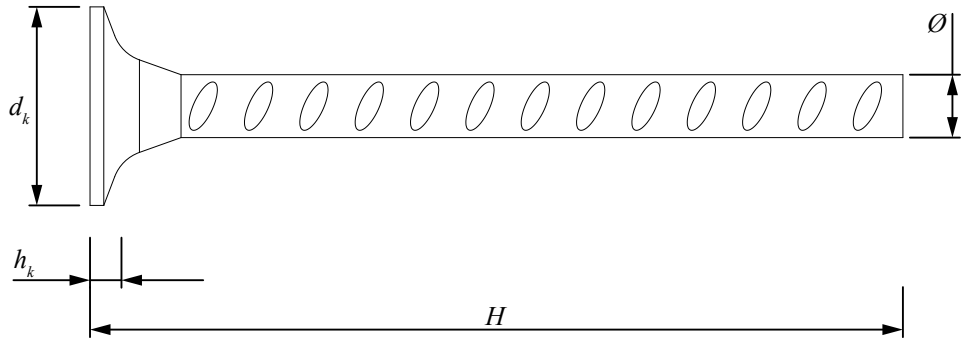
Figure 3. Anchorage length of the hook and PSB® Headed Anchor.

Use of PSB® Headed Anchor under high-cycle fatigue loading shall follow EN 1992-1-1, table 6.3N with requirements for S-N curve of bent bars with mandrel diameter $D = 4Ø - 20Ø$.

3. Dimensions and selecting

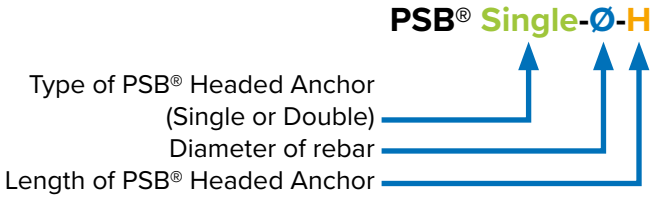
PSB® Single, PSB® Double

Table 1. Dimensions of the PSB® Single and PSB® Double.



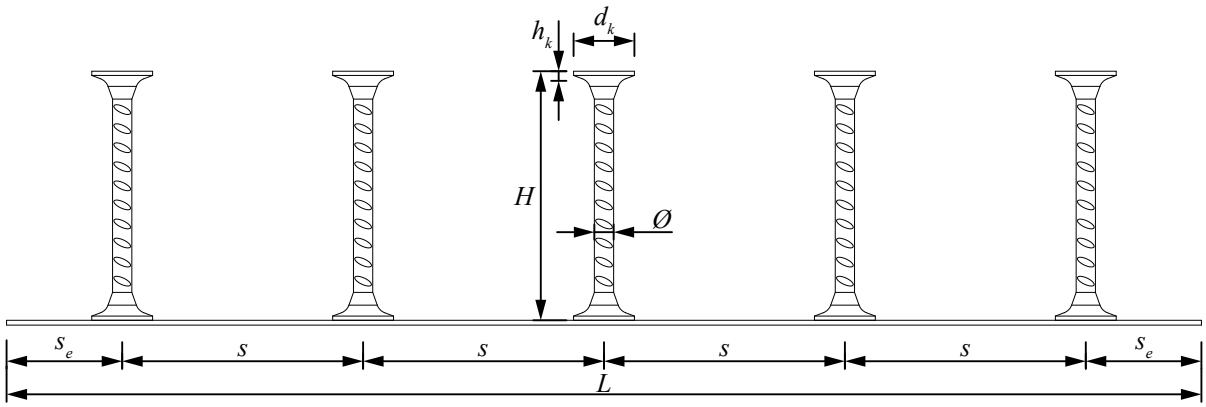
	Rebar diameter Ø [mm]	Head diameter d_k [mm]	Thickness of the head h_k [mm]	Minimum length H_{min} [mm]	Maximum length H_{max} [mm]
PSB® Single 10	10	31	6.0	125	11 500
PSB® Double 10					
PSB® Single 12	12	38	7.0	125	11 500
PSB® Double 12					
PSB® Single 14	14	44	8.0	135	11 500
PSB® Double 14					
PSB® Single 16	16	50.5	8.0	135	11 500
PSB® Double 16					
PSB® Single 20	20	63	10.0	185	11 500
PSB® Double 20					
PSB® Single 25	25	79	13.0	225	11 500
PSB® Double 25					
PSB® Single 28	28	84	21.0	225	11 500
PSB® Double 28					
PSB® Single 32	32	96	23.0	225	11 500
PSB® Double 32					

Selecting



PSB®-S

Table 2. Dimensions of the PSB®-S.



	Rebar diameter Ø [mm]	Head diameter d_k [mm]	Thickness of the head h_k [mm]	Minimum length of stud on rail H_{min} [mm]	Maximum length of stud on rail H_{max} [mm]
PSB®-S 10	10	31	6.0	125	3000
PSB®-S 12	12	38	7.0	125	3000
PSB®-S 14	14	44	8.0	135	3000
PSB®-S 16	16	50.5	8.0	135	3000
PSB®-S 20	20	63	10.0	185	3000
PSB®-S 25	25	79	13.0	225	3000
PSB®-S 28	28	84	21.0	225	3000
PSB®-S 32	32	96	23.0	225	3000

Note: Please note that maximum length of the rail L is limited by length of the pallet and transportation.

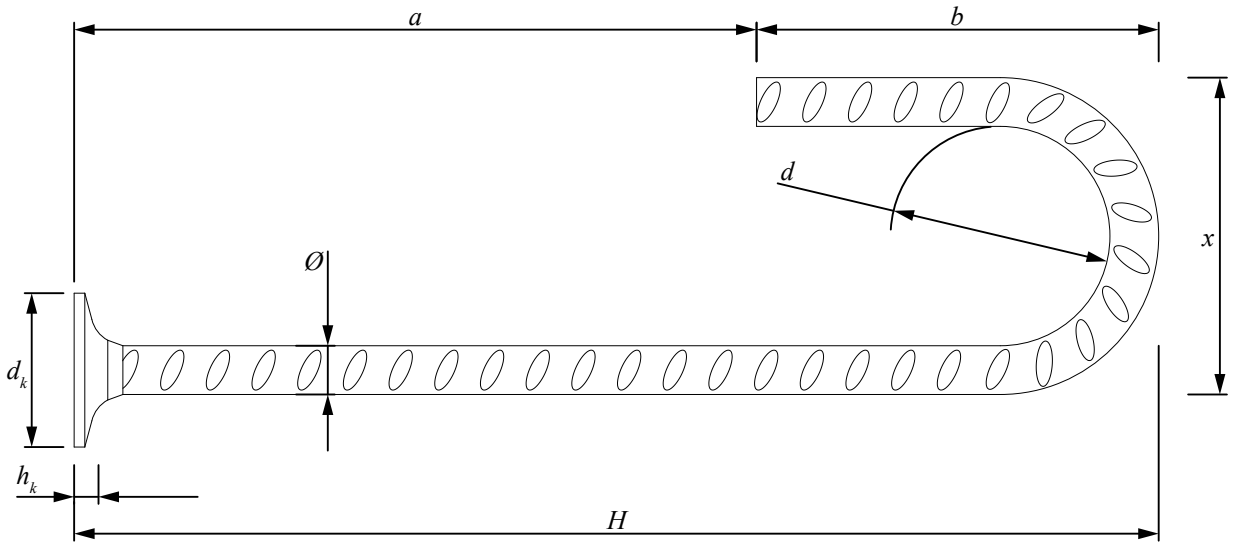
Selecting

PSB®-S Ø/H-n/L(Se/(n-1)xS/Se)

Type of PSB® Headed Anchor
Diameter of rebar
Height of PSB® Headed Anchor
Spacing of the PSB® Headed Anchors on the rail
Total length of PSB®-S element
Number of PSB® Headed Anchors on the rail

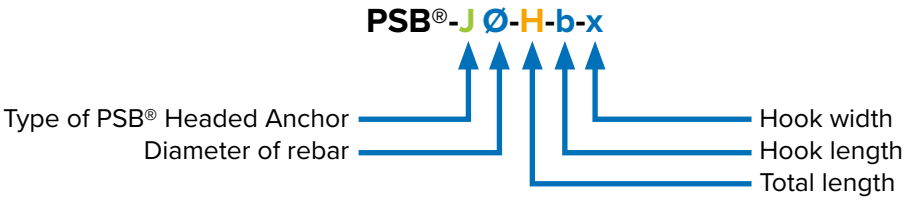
PSB®-J

Table 3. Dimensions of the PSB®-J.



	Rebar diameter Ø [mm]	Head diameter d_k [mm]	Thickness of the head h_k [mm]	Mandrel diameter of the hook d [mm]	Hook length b [mm]	Hook width x [mm]	Minimum length a [mm]	Maximum length H_{max} [mm]
PSB®-J 10	10	31	6.0	40	80	60	125	11400
PSB®-J 12	12	38	7.0	48	96	72	125	11400
PSB®-J 14	14	44	8.0	56	112	84	135	11400
PSB®-J 16	16	50.5	8.0	64	128	96	135	11400
PSB®-J 20	20	63	10.0	140	190	180	185	11400
PSB®-J 25	25	79	13.0	175	237.5	225	225	11400
PSB®-J 28	28	84	21.0	196	266	252	225	11400
PSB®-J 32	32	96	23.0	224	304	288	225	11400

Selecting



Note: The mandrel diameter and dimensions of the hook (dimension d) are defined in accordance with EN 1992-1-1, unless specified otherwise.

NOTES

Revisions

Version: PEIKKO GROUP 07/2024. Revision: 02

- ETA assessment references updated.
- Section 2 ammendments due to ETA update.

Version: PEIKKO GROUP 06/2021. Revision: 01

- First publication.

Resources

DESIGN TOOLS

Use our powerful software every day to make your work faster, easier and more reliable. Peikko design tools include design software, 3D components for modeling programs, installation instructions, technical manuals and product approvals of Peikko's products.

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TECHNICAL SUPPORT

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APPROVALS

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EPDS AND MANAGEMENT SYSTEM CERTIFICATES

Environmental Product Declarations and management system certificates can be found at the quality section of our websites.

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