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European Technical Assessment

**ETA-13/0421
of 29/09/2017**

General part

Technical Assessment Body issuing the European Technical Assessment

Instytut Techniki Budowlanej

Trade name of the construction product

WKSPW

Product family to which the construction product belongs

Fastening screws for sandwich panels

Manufacturer

P.H. HAMAR Sp. J. B. i H. Grzesiak
ul. Hutnicza 7
81-061 Gdynia, Poland

Manufacturing plant

P.H. HAMAR Sp. J. B. i H. Grzesiak
ul. Hutnicza 7
81-061 Gdynia, Poland

This European Technical Assessment contains

36 pages including 31 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

European Assessment Document (EAD)
EAD 330047-01-0602 "Fastening screws for sandwich panels"

This version replaces

ETA-13/0421 issued on 21/06/2013

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Specific part

1. Technical description of the product

The fastening screws for sandwich panels WKSPW are a self-drilling and self-tapping screws listed in Table 1. The fastening screws WKSPW (H) are made of galvanized carbon steel. The fastening screws WKSPW PROTECT (H) are made of galvanized carbon steel additionally protected by ceramic coating PROTECT. The fastening screws WKSPW (HS2) are made of stainless steel (bi-metal). Screws are supplied with a steel washer and an EPDM sealing ring. For details see the Annexes 2 to 29. All screws can be completed with additional steel washer PWP (see Annex 30).

The fastening screw for sandwich panels and the corresponding connections are subject to tension and shear forces.

Table 1

| No. | Screw | Material | Annex |
|-----|----------------------------------|--|----------|
| 1 | WKSPW (H) 5,5/6,3 x L | galvanized carbon steel | 2, 3 |
| 2 | WKSPW (H) 5,5/6,3-20 x L | galvanized carbon steel | 4, 5 |
| 3 | WKSPW PROTECT (H) 5,5/6,3 x L | galvanized carbon steel with PROTECT coating | 6 to 9 |
| 4 | WKSPW PROTECT (H) 5,5/6,3-20 x L | galvanized carbon steel with PROTECT coating | 10, 11 |
| 5 | WKSPW (H) 6,5 x L | galvanized carbon steel | 12, 13 |
| 6 | WKSPW (H) 5,5/6,3-12 x L | galvanized carbon steel | 14, 15 |
| 7 | WKSPW PROTECT (H) 5,5/6,3-12 x L | galvanized carbon steel with PROTECT coating | 16 to 19 |
| 8 | WKSPW PROTECT (H) 5,5/6,3-16 x L | galvanized carbon steel with PROTECT coating | 20 to 23 |
| 9 | WKSPW (HS2) 5,5/6,3 x L | stainless steel | 24, 25 |
| 10 | WKSPW (HS2) 5,5/6,3-12 x L | stainless steel | 26, 27 |
| 11 | WKSPW (HSA2) 6,5-12 x L | stainless steel | 28, 29 |

2. Specification of the intended use in accordance with the applicable European Assessment Document (EAD)

The fastening screws for sandwich panels are intended to be used for fastening sandwich panels to steel or timber substructures. For details see the Annexes 2 to 29. The component to be fastened is component I and the supporting structure is component II. The sandwich panel can either be used as wall or roof cladding or as load bearing wall and roof element.

The intended use comprises fastening screws and connections for indoor and outdoor applications. Fastening screws which are intended to be used in external environments with \geq C2 corrosion according to the standard EN ISO 12944-2 are made of stainless steel.

Furthermore the intended use comprises connections with predominantly static loads (e.g. wind loads, dead loads).

Example of execution of a connections are given in Annex 1.

The provisions made in this European Technical Assessment are based on an assumed working life of the fasteners of 25 years. The indications given on the working life cannot be interpreted as a guarantee given by the producer or Technical 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. Performances of the product and references to the methods used for their assessment

3.1. Performance of the product

3.1.1 Mechanical resistance and stability (BWR 1)

The characteristic values of the shear resistance of connections and tension resistance of connections with the fasteners as well as the maximum head displacement are given in Annex 2 to 29. The values were determined by tests according to EAD 330047-01-0602.

The design values shall be determined according to Annex 31 and EAD 330047-01-0602.

For the corrosion protection the rules given in EN 1993-1-3, EN 1993-1-4 and EN 1999-1-4 shall be taken into account.

3.1.2 Safety in case of fire (BWR 2)

The fastening screws are considered to satisfy the requirements of performance class A1 of reaction to fire, in accordance with the provisions of the EC Decision 96/603/EC (as amended) without the need for testing on the basis of its listing in that decision.

3.1.3 Hygiene, health and the environment (BWR 3)

Regarding the dangerous substances there may be 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.

3.2. Methods used for the assessment

The assessment of fitness of the fasteners for the declared intended use has been made in accordance with EAD 330047-01-0602.

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

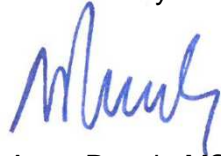
According to Decision 1998/214/EC, amended by 2001/596/EC, of the European Commission the system 2+ of assessment and verification of constancy of performance applies (see Annex V to Regulation (EU) No 305/2011).

5. Technical details necessary for the implementation of the AVCP system, as provided for in the applicable European Assessment Document (EAD)

Technical details necessary for the implementation of the AVCP system are laid down in the control plan deposited at the Instytut Techniki Budowlanej.

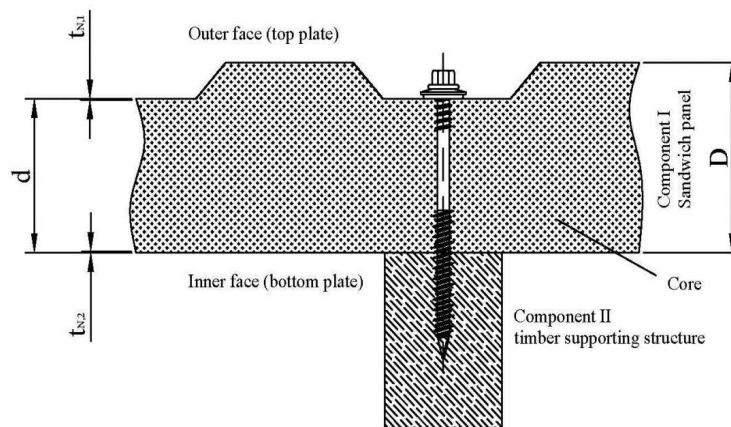
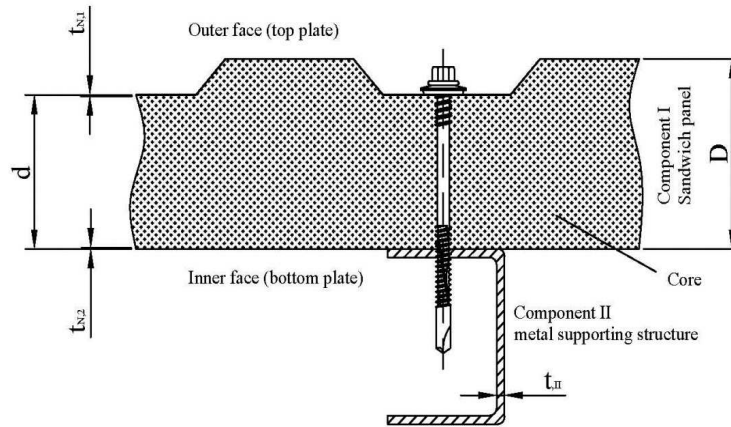
For type testing the results of the tests performed as part of the assessment for the European Technical Assessment shall be used unless there are changes in the production line or plant. In such cases the necessary type testing has to be agreed between Instytut Techniki Budowlanej and the notified body.

Issued in Warsaw on 29/09/2017 by Instytut Techniki Budowlanej

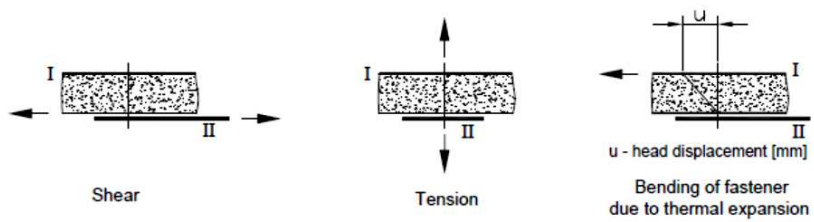


Anna Panek, MSc
Deputy Director of ITB

Examples of execution of a connections



Loading conditions



WKSPW
Fastening screws for sandwich panels

Example of execution of a connections. Loading conditions

Annex 1
of European
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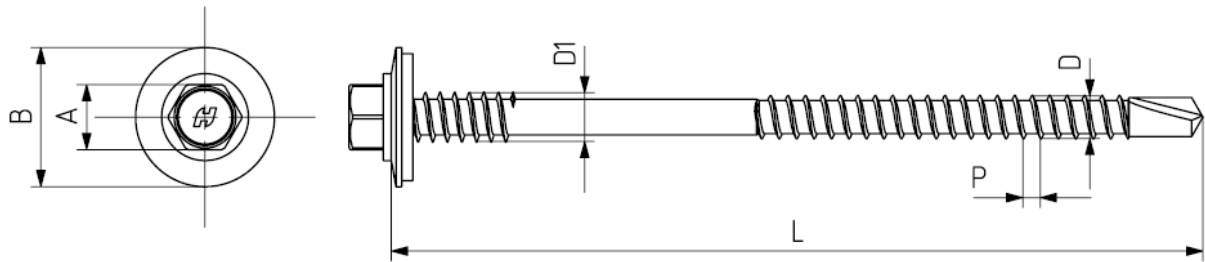
Materials:

Fastener: carbon steel – SAE 1022, quenched, tempered and galvanized ($\geq 12 \mu\text{m}$)
 Washer: metallic washer made of zinc-coated carbon steel with EPDM sealing ring
 Component I: S280GD, S320GD or S350GD – EN 10346
 Component II: S235 – EN 10025-1, S280GD, S320GD or S350GD – EN 10346

Drilling capacity: $\Sigma(t_{N2} + t_{II}) \leq 6 \text{ mm}$

Timber substructure:

No performance assessed



| Component II: t_{II} in [mm] | | 2,00 | 2,50 | 3,00 | 4,00 | 5,00 | 6,00 | 8,00 | $\geq 10,00$ | |
|--|-------------------|------|------|------|------|------|------|------|--------------|---|
| Component I: $t_{N,1}$ or $t_{N,2}$ in [mm] | $V_{R,k}$ in [kN] | 0,40 | 0,82 | 0,82 | 0,82 | 0,82 | 0,82 | — | — | — |
| | | 0,50 | 1,48 | 1,48 | 1,48 | 1,48 | 1,48 | — | — | — |
| | | 0,55 | 1,48 | 1,48 | 1,48 | 1,48 | 1,48 | — | — | — |
| | | 0,63 | 1,65 | 1,65 | 1,65 | 1,65 | 1,65 | — | — | — |
| | | 0,75 | 1,90 | 1,90 | 1,90 | 1,90 | 1,90 | — | — | — |
| | | 0,88 | 1,90 | 1,90 | 1,90 | 1,90 | 1,90 | — | — | — |
| | | 1,00 | 1,90 | 1,90 | 1,90 | 1,90 | 1,90 | — | — | — |
| | $N_{R,k}$ in [kN] | 0,40 | 1,65 | 1,65 | 1,65 | 1,65 | 1,65 | — | — | — |
| | | 0,50 | 2,69 | 2,69 | 2,69 | 2,80 | 2,80 | — | — | — |
| | | 0,55 | 2,69 | 2,69 | 2,69 | 2,80 | 2,80 | — | — | — |
| | | 0,63 | 2,69 | 2,69 | 2,69 | 3,60 | 3,60 | — | — | — |
| | | 0,75 | 2,69 | 2,69 | 2,69 | 4,31 | 4,31 | — | — | — |
| | | 0,88 | 2,69 | 2,69 | 2,69 | 4,31 | 4,31 | — | — | — |
| | | 1,00 | 2,69 | 2,69 | 2,69 | 4,31 | 4,31 | — | — | — |
| max. head displacement u depending on the sandwich panel thickness in [mm] | 30 | 10 | 10 | 0,7 | 0,7 | 0,7 | — | — | — | |
| | 40 | 10 | 10 | 0,7 | 0,7 | 0,7 | — | — | — | |
| | 50 | 10 | 10 | 0,7 | 0,7 | 0,7 | — | — | — | |
| | 60 | 10 | 10 | 2 | 2 | 2 | — | — | — | |
| | 70 | 10 | 10 | 2 | 2 | 2 | — | — | — | |
| | 80 | 10 | 10 | 2 | 2 | 2 | — | — | — | |
| | 90 | 10 | 10 | 3 | 3 | 3 | — | — | — | |
| | 100 | 10 | 10 | 3 | 3 | 3 | — | — | — | |
| | 120 | 10 | 10 | 3 | 3 | 3 | — | — | — | |
| | ≥ 140 | 10 | 10 | 3 | 3 | 3 | — | — | — | |

**WKSPW
Fastening screws for sandwich panels**

WKSPW (H) 5,5/6,3 x L
with hexagon head and steel sealing washer $\varnothing 16 \text{ mm}$

Annex 2
of European
Technical Assessment
ETA-13/0421

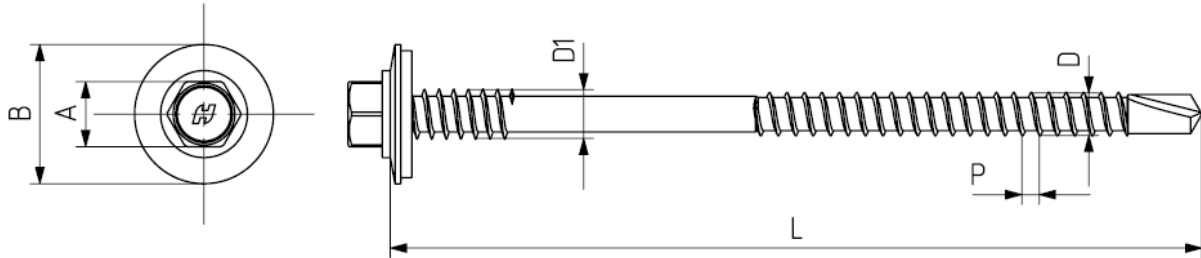
Materials:

Fastener: carbon steel – SAE 1022, quenched, tempered and galvanized ($\geq 12 \mu\text{m}$)
 Washer: metallic washer made of zinc-coated carbon steel with EPDM sealing ring
 Component I: S280GD, S320GD or S350GD – EN 10346
 Component II: S235 – EN 10025-1, S280GD, S320GD or S350GD – EN 10346

Drilling capacity: $\Sigma(t_{N2} + t_{II}) \leq 6 \text{ mm}$

Timber substructure

No performance assessed



| Component II: t_{II} in [mm] | | 2,00 | 2,50 | 3,00 | 4,00 | 5,00 | 6,00 | 8,00 | $\geq 10,00$ |
|--|-------------------|------|------|------|------|------|------|------|--------------|
| Component I: t_{N1} or t_{N2} in [mm] | $V_{R,k}$ in [kN] | 0,40 | 0,82 | 0,82 | 0,82 | 0,82 | — | — | — |
| | | 0,50 | 1,48 | 1,48 | 1,48 | 1,48 | — | — | — |
| | | 0,55 | 1,48 | 1,48 | 1,48 | 1,48 | — | — | — |
| | | 0,63 | 1,65 | 1,65 | 1,65 | 1,65 | — | — | — |
| | | 0,75 | 1,90 | 1,90 | 1,90 | 1,90 | — | — | — |
| | | 0,88 | 1,90 | 1,90 | 1,90 | 1,90 | — | — | — |
| | | 1,00 | 1,90 | 1,90 | 1,90 | 1,90 | — | — | — |
| | $N_{R,k}$ in [kN] | 0,40 | 1,84 | 1,84 | 1,84 | 1,84 | — | — | — |
| | | 0,50 | 2,69 | 2,69 | 2,69 | 3,36 | 3,36 | — | — |
| | | 0,55 | 2,69 | 2,69 | 2,69 | 3,36 | 3,36 | — | — |
| | | 0,63 | 2,69 | 2,69 | 2,69 | 4,12 | 4,12 | — | — |
| | | 0,75 | 2,69 | 2,69 | 2,69 | 5,41 | 5,41 | — | — |
| | | 0,88 | 2,69 | 2,69 | 2,69 | 5,41 | 5,41 | — | — |
| | | 1,00 | 2,69 | 2,69 | 2,69 | 5,41 | 5,41 | — | — |
| max. head displacement u depending on the sandwich panel thickness in [mm] | 30 | 10 | 10 | 0,7 | 0,7 | 0,7 | — | — | — |
| | 40 | 10 | 10 | 0,7 | 0,7 | 0,7 | — | — | — |
| | 50 | 10 | 10 | 0,7 | 0,7 | 0,7 | — | — | — |
| | 60 | 10 | 10 | 2 | 2 | 2 | — | — | — |
| | 70 | 10 | 10 | 2 | 2 | 2 | — | — | — |
| | 80 | 10 | 10 | 2 | 2 | 2 | — | — | — |
| | 90 | 10 | 10 | 3 | 3 | 3 | — | — | — |
| | 100 | 10 | 10 | 3 | 3 | 3 | — | — | — |
| | 120 | 10 | 10 | 3 | 3 | 3 | — | — | — |
| | ≥ 140 | 10 | 10 | 3 | 3 | 3 | — | — | — |

WKSPW
Fastening screws for sandwich panels

WKSPW (H) 5,5/6,3 x L
 with hexagon head and steel sealing washer $\geq \text{Ø}19 \text{ mm}$

Annex 3
 of European
 Technical Assessment
 ETA-13/0421

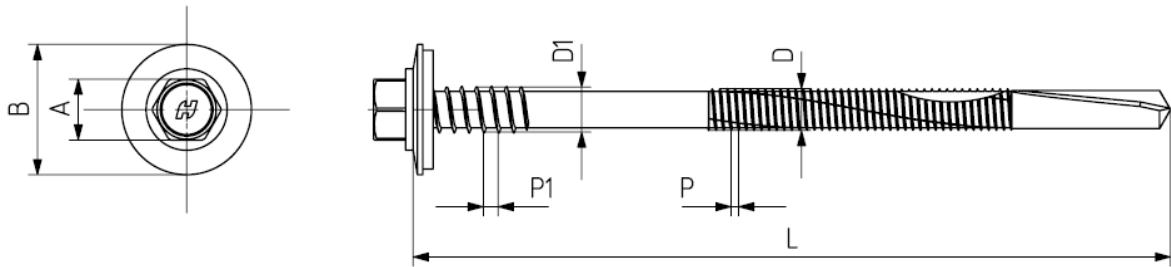
Materials:

Fastener: carbon steel – SAE 1022, quenched, tempered and galvanized ($\geq 12 \mu\text{m}$)
 Washer: metallic washer made of zinc-coated carbon steel with EPDM sealing ring
 Component I: S280GD, S320GD or S350GD – EN 10346
 Component II: S235 – EN 10025-1, S280GD, S320GD or S350GD – EN 10346

Drilling capacity: $\Sigma(t_{N2} + t_{II}) \leq 20 \text{ mm}$

Timber substructure:

No performance assessed



| Component II: t_{II} in [mm] | | 8,00 | 10,00 | 11,00 | 12,00 | 14,00 | 15,00 | 16,00 | $\geq 18,00$ | |
|--|-------------------|-------------------|-------|-------|-------|-------|-------|-------|--------------|------|
| Component I: t_{N1} or t_{N2} in [mm] | $V_{R,k}$ in [kN] | 0,40 | 0,85 | 0,85 | 0,85 | 0,85 | 0,85 | 0,85 | 0,85 | 0,85 |
| | | 0,50 | 1,40 | 1,40 | 1,40 | 1,40 | 1,40 | 1,40 | 1,40 | 1,40 |
| | | 0,55 | 1,40 | 1,40 | 1,40 | 1,40 | 1,40 | 1,40 | 1,40 | 1,40 |
| | | 0,63 | 1,70 | 1,70 | 1,70 | 1,70 | 1,70 | 1,70 | 1,70 | 1,70 |
| | | 0,75 | 1,98 | 1,98 | 1,98 | 1,98 | 1,98 | 1,98 | 1,98 | 1,98 |
| | | 0,88 | 1,98 | 1,98 | 1,98 | 1,98 | 1,98 | 1,98 | 1,98 | 1,98 |
| | | 1,00 | 1,98 | 1,98 | 1,98 | 1,98 | 1,98 | 1,98 | 1,98 | 1,98 |
| | | $N_{R,k}$ in [kN] | 0,40 | 1,65 | 1,65 | 1,65 | 1,65 | 1,65 | 1,65 | 1,65 |
| 0,50 | 2,80 | | 2,80 | 2,80 | 2,80 | 2,80 | 2,80 | 2,80 | 2,80 | |
| 0,55 | 2,80 | | 2,80 | 2,80 | 2,80 | 2,80 | 2,80 | 2,80 | 2,80 | |
| 0,63 | 3,60 | | 3,60 | 3,60 | 3,60 | 3,60 | 3,60 | 3,60 | 3,60 | |
| 0,75 | 4,31 | | 4,31 | 4,31 | 4,31 | 4,31 | 4,31 | 4,31 | 4,31 | |
| 0,88 | 4,31 | | 4,31 | 4,31 | 4,31 | 4,31 | 4,31 | 4,31 | 4,31 | |
| 1,00 | 4,31 | | 4,31 | 4,31 | 4,31 | 4,31 | 4,31 | 4,31 | 4,31 | |
| max. head displacement u depending on the sandwich panel thickness in [mm] | 30 | | 0,7 | 0,7 | 0,7 | 0,7 | 0,7 | 0,7 | 0,7 | 0,7 |
| | 40 | 0,7 | 0,7 | 0,7 | 0,7 | 0,7 | 0,7 | 0,7 | 0,7 | |
| | 50 | 0,7 | 0,7 | 0,7 | 0,7 | 0,7 | 0,7 | 0,7 | 0,7 | |
| | 60 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | |
| | 70 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | |
| | 80 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | |
| | 90 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | |
| | 100 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | |
| | 120 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | |
| | ≥ 140 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | |

**WKSPW
Fastening screws for sandwich panels**

WKSPW (H) 5,5/6,3-20 x L
with hexagon head and steel sealing washer $\varnothing 16 \text{ mm}$

Annex 4
of European
Technical Assessment
ETA-13/0421

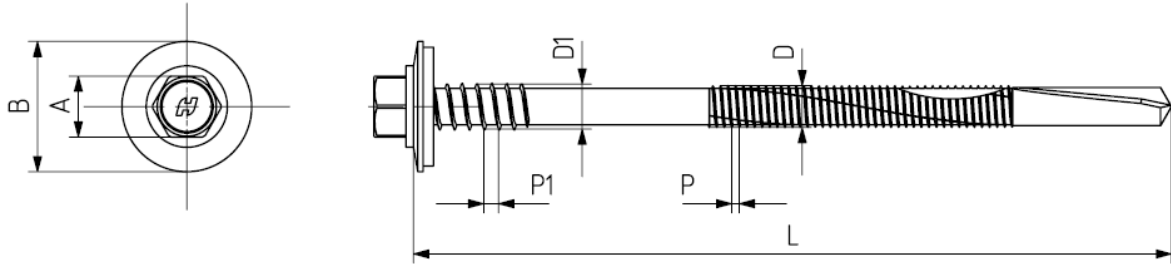
Materials:

Fastener: carbon steel – SAE 1022, quenched, tempered and galvanized ($\geq 12 \mu\text{m}$)
 Washer: metallic washer made of zinc-coated carbon steel with EPDM sealing ring
 Component I: S280GD, S320GD or S350GD – EN 10346
 Component II: S235 – EN 10025-1, S280GD, S320GD or S350GD – EN 10346

Drilling capacity: $\Sigma(t_{N2} + t_{II}) \leq 20 \text{ mm}$

Timber substructure

No performance assessed



| Component II: t_{II} in [mm] | | 8,00 | 10,00 | 11,00 | 12,00 | 14,00 | 15,00 | 16,00 | $\geq 18,00$ | |
|--|-------------------|------|-------|-------|-------|-------|-------|-------|--------------|------|
| Component I: t_{N1} or t_{N2} in [mm] | $V_{R,k}$ in [kN] | 0,40 | 0,85 | 0,85 | 0,85 | 0,85 | 0,85 | 0,85 | 0,85 | 0,85 |
| | | 0,50 | 1,40 | 1,40 | 1,40 | 1,40 | 1,40 | 1,40 | 1,40 | 1,40 |
| | | 0,55 | 1,40 | 1,40 | 1,40 | 1,40 | 1,40 | 1,40 | 1,40 | 1,40 |
| | | 0,63 | 1,70 | 1,70 | 1,70 | 1,70 | 1,70 | 1,70 | 1,70 | 1,70 |
| | | 0,75 | 1,98 | 1,98 | 1,98 | 1,98 | 1,98 | 1,98 | 1,98 | 1,98 |
| | | 0,88 | 1,98 | 1,98 | 1,98 | 1,98 | 1,98 | 1,98 | 1,98 | 1,98 |
| | | 1,00 | 1,98 | 1,98 | 1,98 | 1,98 | 1,98 | 1,98 | 1,98 | 1,98 |
| | $N_{R,k}$ in [kN] | 0,40 | 1,84 | 1,84 | 1,84 | 1,84 | 1,84 | 1,84 | 1,84 | 1,84 |
| | | 0,50 | 3,36 | 3,36 | 3,36 | 3,36 | 3,36 | 3,36 | 3,36 | 3,36 |
| | | 0,55 | 3,36 | 3,36 | 3,36 | 3,36 | 3,36 | 3,36 | 3,36 | 3,36 |
| | | 0,63 | 4,12 | 4,12 | 4,12 | 4,12 | 4,12 | 4,12 | 4,12 | 4,12 |
| | | 0,75 | 5,41 | 5,41 | 5,41 | 5,41 | 5,41 | 5,41 | 5,41 | 5,41 |
| | | 0,88 | 5,41 | 5,41 | 5,41 | 5,41 | 5,41 | 5,41 | 5,41 | 5,41 |
| | | 1,00 | 5,41 | 5,41 | 5,41 | 5,41 | 5,41 | 5,41 | 5,41 | 5,41 |
| max. head displacement u depending on the sandwich panel thickness in [mm] | 30 | 0,7 | 0,7 | 0,7 | 0,7 | 0,7 | 0,7 | 0,7 | 0,7 | |
| | 40 | 0,7 | 0,7 | 0,7 | 0,7 | 0,7 | 0,7 | 0,7 | 0,7 | |
| | 50 | 0,7 | 0,7 | 0,7 | 0,7 | 0,7 | 0,7 | 0,7 | 0,7 | |
| | 60 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | |
| | 70 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | |
| | 80 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | |
| | 90 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | |
| | 100 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | |
| | 120 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | |
| | ≥ 140 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | |

WKSPW
Fastening screws for sandwich panels

WKSPW (H) 5,5/6,3-20 x L
 with hexagon head and steel sealing washer $\geq \text{Ø}19 \text{ mm}$

Annex 5

of European
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 ETA-13/0421

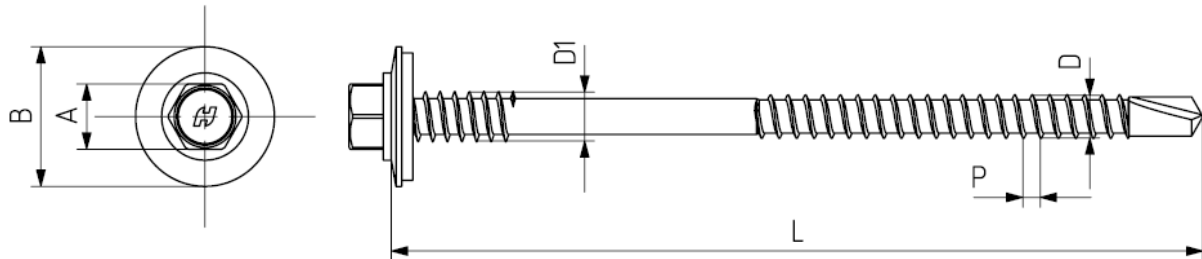
Materials:

Fastener: carbon steel – SAE 1022, quenched, tempered and galvanized, additional coating PROTECT
 Washer: metallic washer made of zinc-coated carbon steel with EPDM sealing ring
 Component I: S280GD, S320GD or S350GD – EN 10346
 Component II: S235 – EN 10025-1, S280GD, S320GD or S350GD – EN 10346

Drilling capacity: $\Sigma(t_{N2} + t_{II}) \leq 6 \text{ mm}$

Timber substructure

No performance assessed



| Component II: t_{II} in [mm] | | 2,00 | 2,50 | 3,00 | 4,00 | 5,00 | 6,00 | 8,00 | $\geq 10,00$ | |
|--|-------------------|------|------|------|------|------|------|------|--------------|---|
| Component I: t_{N1} or t_{N2} in [mm] | $V_{R,k}$ in [kN] | 0,40 | 0,82 | 0,82 | 0,82 | 0,82 | 0,82 | — | — | — |
| | | 0,50 | 1,48 | 1,48 | 1,48 | 1,48 | 1,48 | — | — | — |
| | | 0,55 | 1,48 | 1,48 | 1,48 | 1,48 | 1,48 | — | — | — |
| | | 0,63 | 1,65 | 1,65 | 1,65 | 1,65 | 1,65 | — | — | — |
| | | 0,75 | 1,90 | 1,90 | 1,90 | 1,90 | 1,90 | — | — | — |
| | | 0,88 | 1,90 | 1,90 | 1,90 | 1,90 | 1,90 | — | — | — |
| | | 1,00 | 1,90 | 1,90 | 1,90 | 1,90 | 1,90 | — | — | — |
| | $N_{R,k}$ in [kN] | 0,40 | 1,65 | 1,65 | 1,65 | 1,65 | 1,65 | — | — | — |
| | | 0,50 | 2,69 | 2,69 | 2,69 | 2,80 | 2,80 | — | — | — |
| | | 0,55 | 2,69 | 2,69 | 2,69 | 2,80 | 2,80 | — | — | — |
| | | 0,63 | 2,69 | 2,69 | 2,69 | 3,60 | 3,60 | — | — | — |
| | | 0,75 | 2,69 | 2,69 | 2,69 | 4,31 | 4,31 | — | — | — |
| | | 0,88 | 2,69 | 2,69 | 2,69 | 4,31 | 4,31 | — | — | — |
| | | 1,00 | 2,69 | 2,69 | 2,69 | 4,31 | 4,31 | — | — | — |
| max. head displacement u depending on the sandwich panel thickness in [mm] | 30 | 10 | 10 | 0,7 | 0,7 | 0,7 | — | — | — | |
| | 40 | 10 | 10 | 0,7 | 0,7 | 0,7 | — | — | — | |
| | 50 | 10 | 10 | 0,7 | 0,7 | 0,7 | — | — | — | |
| | 60 | 10 | 10 | 2 | 2 | 2 | — | — | — | |
| | 70 | 10 | 10 | 2 | 2 | 2 | — | — | — | |
| | 80 | 10 | 10 | 2 | 2 | 2 | — | — | — | |
| | 90 | 10 | 10 | 3 | 3 | 3 | — | — | — | |
| | 100 | 10 | 10 | 3 | 3 | 3 | — | — | — | |
| | 120 | 10 | 10 | 3 | 3 | 3 | — | — | — | |
| | ≥ 140 | 10 | 10 | 3 | 3 | 3 | — | — | — | |

**WKSPW
Fastening screws for sandwich panels**

WKSPW PROTECT (H) 5,5/6,3 x L
with hexagon head and steel sealing washer $\varnothing 16 \text{ mm}$

Annex 6
of European
Technical Assessment
ETA-13/0421

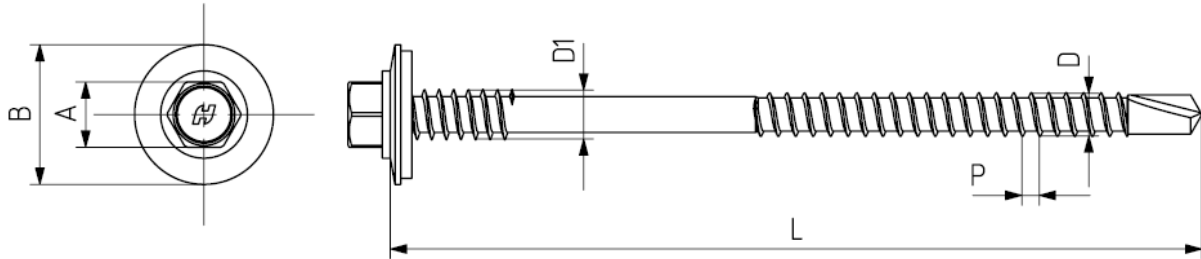
Materials:

Fastener: carbon steel – SAE 1022, quenched, tempered and galvanized, additional coating PROTECT
 Washer: metallic washer made of zinc-coated carbon steel with EPDM sealing ring
 Component I: S280GD, S320GD or S350GD – EN 10346
 Component II: S235 – EN 10025-1, S280GD, S320GD or S350GD – EN 10346

Drilling capacity: $\Sigma(t_{N2} + t_{II}) \leq 6 \text{ mm}$

Timber substructure

No performance assessed



| Component II: t_{II} in [mm] | | 2,00 | 2,50 | 3,00 | 4,00 | 5,00 | 6,00 | 8,00 | $\geq 10,00$ | |
|--|-------------------|------|------|------|------|------|------|------|--------------|---|
| Component I: t_{N1} or t_{N2} in [mm] | $V_{R,k}$ in [kN] | 0,40 | 0,82 | 0,82 | 0,82 | 0,82 | 0,82 | — | — | — |
| | | 0,50 | 1,48 | 1,48 | 1,48 | 1,48 | 1,48 | — | — | — |
| | | 0,55 | 1,48 | 1,48 | 1,48 | 1,48 | 1,48 | — | — | — |
| | | 0,63 | 1,65 | 1,65 | 1,65 | 1,65 | 1,65 | — | — | — |
| | | 0,75 | 1,90 | 1,90 | 1,90 | 1,90 | 1,90 | — | — | — |
| | | 0,88 | 1,90 | 1,90 | 1,90 | 1,90 | 1,90 | — | — | — |
| | | 1,00 | 1,90 | 1,90 | 1,90 | 1,90 | 1,90 | — | — | — |
| | $N_{R,k}$ in [kN] | 0,40 | 1,84 | 1,84 | 1,84 | 1,84 | 1,84 | — | — | — |
| | | 0,50 | 2,69 | 2,69 | 2,69 | 3,36 | 3,36 | — | — | — |
| | | 0,55 | 2,69 | 2,69 | 2,69 | 3,36 | 3,36 | — | — | — |
| | | 0,63 | 2,69 | 2,69 | 2,69 | 4,12 | 4,12 | — | — | — |
| | | 0,75 | 2,69 | 2,69 | 2,69 | 5,41 | 5,41 | — | — | — |
| | | 0,88 | 2,69 | 2,69 | 2,69 | 5,41 | 5,41 | — | — | — |
| | | 1,00 | 2,69 | 2,69 | 2,69 | 5,41 | 5,41 | — | — | — |
| max. head displacement u depending on the sandwich panel thickness in [mm] | 30 | 10 | 10 | 0,7 | 0,7 | 0,7 | — | — | — | |
| | 40 | 10 | 10 | 0,7 | 0,7 | 0,7 | — | — | — | |
| | 50 | 10 | 10 | 0,7 | 0,7 | 0,7 | — | — | — | |
| | 60 | 10 | 10 | 2 | 2 | 2 | — | — | — | |
| | 70 | 10 | 10 | 2 | 2 | 2 | — | — | — | |
| | 80 | 10 | 10 | 2 | 2 | 2 | — | — | — | |
| | 90 | 10 | 10 | 3 | 3 | 3 | — | — | — | |
| | 100 | 10 | 10 | 3 | 3 | 3 | — | — | — | |
| | 120 | 10 | 10 | 3 | 3 | 3 | — | — | — | |
| | ≥ 140 | 10 | 10 | 3 | 3 | 3 | — | — | — | |

**WKSPW
Fastening screws for sandwich panels**

WKSPW PROTECT (H) 5,5/6,3 x L
with hexagon head and steel sealing washer $\geq \text{Ø}19 \text{ mm}$

Annex 7
of European
Technical Assessment
ETA-13/0421

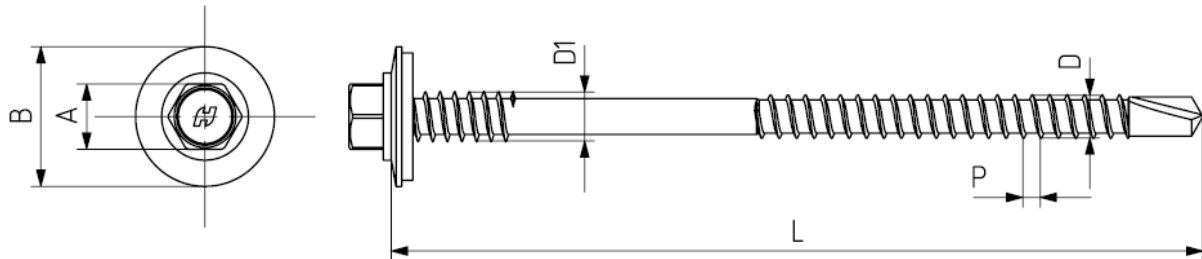
Materials:

Fastener: carbon steel – SAE 1022, quenched, tempered and galvanized, additional coating PROTECT
 Washer: metallic washer made of stainless steel with EPDM sealing ring
 Component I: S280GD, S320GD or S350GD – EN 10346
 Component II: S235 – EN 10025-1, S280GD, S320GD or S350GD – EN 10346

Drilling capacity: $\Sigma(t_{N2} + t_{II}) \leq 6 \text{ mm}$

Timber substructure

No performance assessed



| Component II: t_{II} in [mm] | | 2,00 | 2,50 | 3,00 | 4,00 | 5,00 | 6,00 | 8,00 | $\geq 10,00$ |
|--|-------------------|------|------|------|------|------|------|------|--------------|
| Component I: t_{N1} or t_{N2} in [mm] | $V_{R,k}$ in [kN] | 0,40 | 0,82 | 0,82 | 0,82 | 0,82 | — | — | — |
| | | 0,50 | 1,48 | 1,48 | 1,48 | 1,48 | — | — | — |
| | | 0,55 | 1,48 | 1,48 | 1,48 | 1,48 | — | — | — |
| | | 0,63 | 1,65 | 1,65 | 1,65 | 1,65 | — | — | — |
| | | 0,75 | 1,90 | 1,90 | 1,90 | 1,90 | — | — | — |
| | | 0,88 | 1,90 | 1,90 | 1,90 | 1,90 | — | — | — |
| | | 1,00 | 1,90 | 1,90 | 1,90 | 1,90 | — | — | — |
| | $N_{R,k}$ in [kN] | 0,40 | 1,65 | 1,65 | 1,65 | 1,65 | — | — | — |
| | | 0,50 | 2,69 | 2,69 | 2,69 | 2,80 | — | — | — |
| | | 0,55 | 2,69 | 2,69 | 2,69 | 2,80 | — | — | — |
| | | 0,63 | 2,69 | 2,69 | 2,69 | 3,60 | — | — | — |
| | | 0,75 | 2,69 | 2,69 | 2,69 | 4,31 | — | — | — |
| | | 0,88 | 2,69 | 2,69 | 2,69 | 4,31 | — | — | — |
| | | 1,00 | 2,69 | 2,69 | 2,69 | 4,31 | — | — | — |
| max. head displacement u depending on the sandwich panel thickness in [mm] | 30 | 10 | 10 | 0,7 | 0,7 | 0,7 | — | — | — |
| | 40 | 10 | 10 | 0,7 | 0,7 | 0,7 | — | — | — |
| | 50 | 10 | 10 | 0,7 | 0,7 | 0,7 | — | — | — |
| | 60 | 10 | 10 | 2 | 2 | 2 | — | — | — |
| | 70 | 10 | 10 | 2 | 2 | 2 | — | — | — |
| | 80 | 10 | 10 | 2 | 2 | 2 | — | — | — |
| | 90 | 10 | 10 | 3 | 3 | 3 | — | — | — |
| | 100 | 10 | 10 | 3 | 3 | 3 | — | — | — |
| | 120 | 10 | 10 | 3 | 3 | 3 | — | — | — |
| | ≥ 140 | 10 | 10 | 3 | 3 | 3 | — | — | — |

**WKSPW
Fastening screws for sandwich panels**

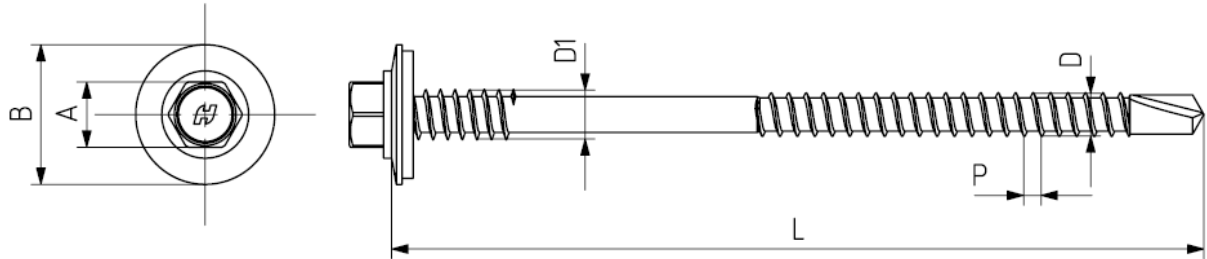
WKSPW PROTECT (H) 5,5/6,3 x L
with hexagon head and steel sealing washer $\varnothing 16 \text{ mm}$

Annex 8
of European
Technical Assessment
ETA-13/0421

Materials:
 Fastener: carbon steel – SAE 1022, quenched, tempered and galvanized, additional coating PROTECT
 Washer: metallic washer made of stainless steel with EPDM sealing ring
 Component I: S280GD, S320GD or S350GD – EN 10346
 Component II: S235 – EN 10025-1, S280GD, S320GD or S350GD – EN 10346

Drilling capacity: $\Sigma(t_{N2} + t_{II}) \leq 6$ mm

Timber substructure
 No performance assessed



| Component II: t_{II} in [mm] | | 2,00 | 2,50 | 3,00 | 4,00 | 5,00 | 6,00 | 8,00 | $\geq 10,00$ | |
|--|-------------------|------|------|------|------|------|------|------|--------------|---|
| Component I: t_{N1} or t_{N2} in [mm] | $V_{R,k}$ in [kN] | 0,40 | 0,82 | 0,82 | 0,82 | 0,82 | 0,82 | — | — | — |
| | | 0,50 | 1,48 | 1,48 | 1,48 | 1,48 | 1,48 | — | — | — |
| | | 0,55 | 1,48 | 1,48 | 1,48 | 1,48 | 1,48 | — | — | — |
| | | 0,63 | 1,65 | 1,65 | 1,65 | 1,65 | 1,65 | — | — | — |
| | | 0,75 | 1,90 | 1,90 | 1,90 | 1,90 | 1,90 | — | — | — |
| | | 0,88 | 1,90 | 1,90 | 1,90 | 1,90 | 1,90 | — | — | — |
| | | 1,00 | 1,90 | 1,90 | 1,90 | 1,90 | 1,90 | — | — | — |
| | $N_{R,k}$ in [kN] | 0,40 | 1,84 | 1,84 | 1,84 | 1,84 | 1,84 | — | — | — |
| | | 0,50 | 2,69 | 2,69 | 2,69 | 3,36 | 3,36 | — | — | — |
| | | 0,55 | 2,69 | 2,69 | 2,69 | 3,36 | 3,36 | — | — | — |
| | | 0,63 | 2,69 | 2,69 | 2,69 | 4,12 | 4,12 | — | — | — |
| | | 0,75 | 2,69 | 2,69 | 2,69 | 5,41 | 5,41 | — | — | — |
| | | 0,88 | 2,69 | 2,69 | 2,69 | 5,41 | 5,41 | — | — | — |
| | | 1,00 | 2,69 | 2,69 | 2,69 | 5,41 | 5,41 | — | — | — |
| max. head displacement u depending on the sandwich panel thickness in [mm] | 30 | 10 | 10 | 0,7 | 0,7 | 0,7 | — | — | — | |
| | 40 | 10 | 10 | 0,7 | 0,7 | 0,7 | — | — | — | |
| | 50 | 10 | 10 | 0,7 | 0,7 | 0,7 | — | — | — | |
| | 60 | 10 | 10 | 2 | 2 | 2 | — | — | — | |
| | 70 | 10 | 10 | 2 | 2 | 2 | — | — | — | |
| | 80 | 10 | 10 | 2 | 2 | 2 | — | — | — | |
| | 90 | 10 | 10 | 3 | 3 | 3 | — | — | — | |
| | 100 | 10 | 10 | 3 | 3 | 3 | — | — | — | |
| | 120 | 10 | 10 | 3 | 3 | 3 | — | — | — | |
| | ≥ 140 | 10 | 10 | 3 | 3 | 3 | — | — | — | |

WKSPW
Fastening screws for sandwich panels

WKSPW PROTECT (H) 5,5/6,3 x L
 with hexagon head and steel sealing washer $\geq \text{Ø}19$ mm

Annex 9
 of European
 Technical Assessment
 ETA-13/0421

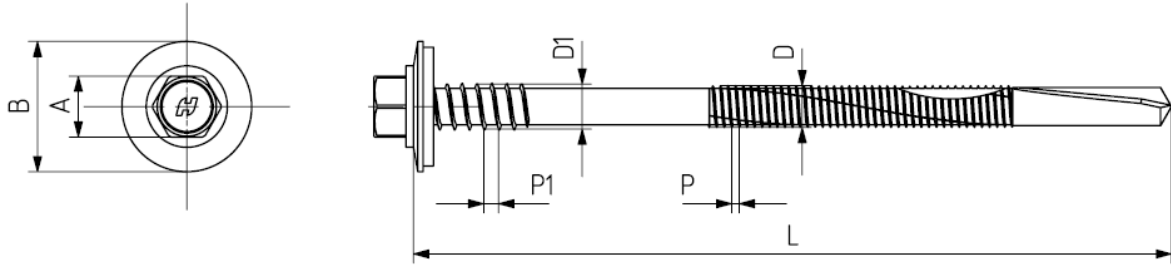
Materials:

- Fastener: carbon steel – SAE 1022, quenched, tempered and galvanized, additional coating PROTECT
- Washer: metallic washer made of stainless steel with EPDM sealing ring
- Component I: S280GD, S320GD or S350GD – EN 10346
- Component II: S235 – EN 10025-1, S280GD, S320GD or S350GD – EN 10346

Drilling capacity: $\Sigma(t_{N2} + t_{II}) \leq 20$ mm

Timber substructure

No performance assessed



| Component II: t_{II} in [mm] | | 8,00 | 10,00 | 11,00 | 12,00 | 14,00 | 15,00 | 16,00 | $\geq 18,00$ | |
|---|--|-------------------|-------|-------|-------|-------|-------|-------|--------------|------|
| Component I: t_{N1} or t_{N2} in [mm] | $V_{R,k}$ in [kN] | 0,40 | 0,85 | 0,85 | 0,85 | 0,85 | 0,85 | 0,85 | 0,85 | 0,85 |
| | | 0,50 | 1,40 | 1,40 | 1,40 | 1,40 | 1,40 | 1,40 | 1,40 | 1,40 |
| | | 0,55 | 1,40 | 1,40 | 1,40 | 1,40 | 1,40 | 1,40 | 1,40 | 1,40 |
| | | 0,63 | 1,70 | 1,70 | 1,70 | 1,70 | 1,70 | 1,70 | 1,70 | 1,70 |
| | | 0,75 | 1,98 | 1,98 | 1,98 | 1,98 | 1,98 | 1,98 | 1,98 | 1,98 |
| | | 0,88 | 1,98 | 1,98 | 1,98 | 1,98 | 1,98 | 1,98 | 1,98 | 1,98 |
| | | 1,00 | 1,98 | 1,98 | 1,98 | 1,98 | 1,98 | 1,98 | 1,98 | 1,98 |
| | | $N_{R,k}$ in [kN] | 0,40 | 1,65 | 1,65 | 1,65 | 1,65 | 1,65 | 1,65 | 1,65 |
| | 0,50 | | 2,80 | 2,80 | 2,80 | 2,80 | 2,80 | 2,80 | 2,80 | 2,80 |
| | 0,55 | | 2,80 | 2,80 | 2,80 | 2,80 | 2,80 | 2,80 | 2,80 | 2,80 |
| | 0,63 | | 3,60 | 3,60 | 3,60 | 3,60 | 3,60 | 3,60 | 3,60 | 3,60 |
| | 0,75 | | 4,31 | 4,31 | 4,31 | 4,31 | 4,31 | 4,31 | 4,31 | 4,31 |
| | 0,88 | | 4,31 | 4,31 | 4,31 | 4,31 | 4,31 | 4,31 | 4,31 | 4,31 |
| | 1,00 | | 4,31 | 4,31 | 4,31 | 4,31 | 4,31 | 4,31 | 4,31 | 4,31 |
| | max. head displacement u depending on the sandwich panel thickness in [mm] | | 30 | 0,7 | 0,7 | 0,7 | 0,7 | 0,7 | 0,7 | 0,7 |
| | | 40 | 0,7 | 0,7 | 0,7 | 0,7 | 0,7 | 0,7 | 0,7 | 0,7 |
| 50 | | 0,7 | 0,7 | 0,7 | 0,7 | 0,7 | 0,7 | 0,7 | 0,7 | |
| 60 | | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | |
| 70 | | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | |
| 80 | | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | |
| 90 | | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | |
| 100 | | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | |
| 120 | | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | |
| ≥ 140 | | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | |

**WKSPW
Fastening screws for sandwich panels**

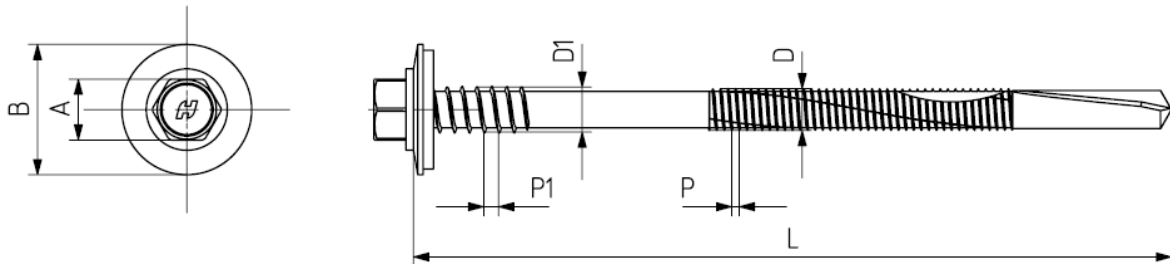
WKSPW PROTECT (H) 5,5/6,3-20 x L
with hexagon head and steel sealing washer $\varnothing 16$ mm

Annex 10
of European
Technical Assessment
ETA-13/0421

Materials:
 Fastener: carbon steel – SAE 1022, quenched, tempered and galvanized, additional coating PROTECT
 Washer: metallic washer made of stainless steel with EPDM sealing ring
 Component I: S280GD, S320GD or S350GD – EN 10346
 Component II: S235 – EN 10025-1, S280GD, S320GD or S350GD – EN 10346

Drilling capacity: $\Sigma(t_{N2} + t_{II}) \leq 20$ mm

Timber substructure
 No performance assessed



| Component II: t_{II} in [mm] | | 8,00 | 10,00 | 11,00 | 12,00 | 14,00 | 15,00 | 16,00 | ≥ 18,00 | |
|--|-------------------|------|-------|-------|-------|-------|-------|-------|---------|------|
| Component I: t_{N1} or t_{N2} in [mm] | $V_{R,k}$ in [kN] | 0,40 | 0,85 | 0,85 | 0,85 | 0,85 | 0,85 | 0,85 | 0,85 | 0,85 |
| | | 0,50 | 1,40 | 1,40 | 1,40 | 1,40 | 1,40 | 1,40 | 1,40 | 1,40 |
| | | 0,55 | 1,40 | 1,40 | 1,40 | 1,40 | 1,40 | 1,40 | 1,40 | 1,40 |
| | | 0,63 | 1,70 | 1,70 | 1,70 | 1,70 | 1,70 | 1,70 | 1,70 | 1,70 |
| | | 0,75 | 1,98 | 1,98 | 1,98 | 1,98 | 1,98 | 1,98 | 1,98 | 1,98 |
| | | 0,88 | 1,98 | 1,98 | 1,98 | 1,98 | 1,98 | 1,98 | 1,98 | 1,98 |
| | | 1,00 | 1,98 | 1,98 | 1,98 | 1,98 | 1,98 | 1,98 | 1,98 | 1,98 |
| | $N_{R,k}$ in [kN] | 0,40 | 1,84 | 1,84 | 1,84 | 1,84 | 1,84 | 1,84 | 1,84 | 1,84 |
| | | 0,50 | 3,36 | 3,36 | 3,36 | 3,36 | 3,36 | 3,36 | 3,36 | 3,36 |
| | | 0,55 | 3,36 | 3,36 | 3,36 | 3,36 | 3,36 | 3,36 | 3,36 | 3,36 |
| | | 0,63 | 4,12 | 4,12 | 4,12 | 4,12 | 4,12 | 4,12 | 4,12 | 4,12 |
| | | 0,75 | 5,41 | 5,41 | 5,41 | 5,41 | 5,41 | 5,41 | 5,41 | 5,41 |
| | | 0,88 | 5,41 | 5,41 | 5,41 | 5,41 | 5,41 | 5,41 | 5,41 | 5,41 |
| | | 1,00 | 5,41 | 5,41 | 5,41 | 5,41 | 5,41 | 5,41 | 5,41 | 5,41 |
| max. head displacement u depending on the sandwich panel thickness in [mm] | 30 | 0,7 | 0,7 | 0,7 | 0,7 | 0,7 | 0,7 | 0,7 | 0,7 | |
| | 40 | 0,7 | 0,7 | 0,7 | 0,7 | 0,7 | 0,7 | 0,7 | 0,7 | |
| | 50 | 0,7 | 0,7 | 0,7 | 0,7 | 0,7 | 0,7 | 0,7 | 0,7 | |
| | 60 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | |
| | 70 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | |
| | 80 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | |
| | 90 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | |
| | 100 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | |
| | 120 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | |
| | ≥140 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | |

WKSPW
Fastening screws for sandwich panels

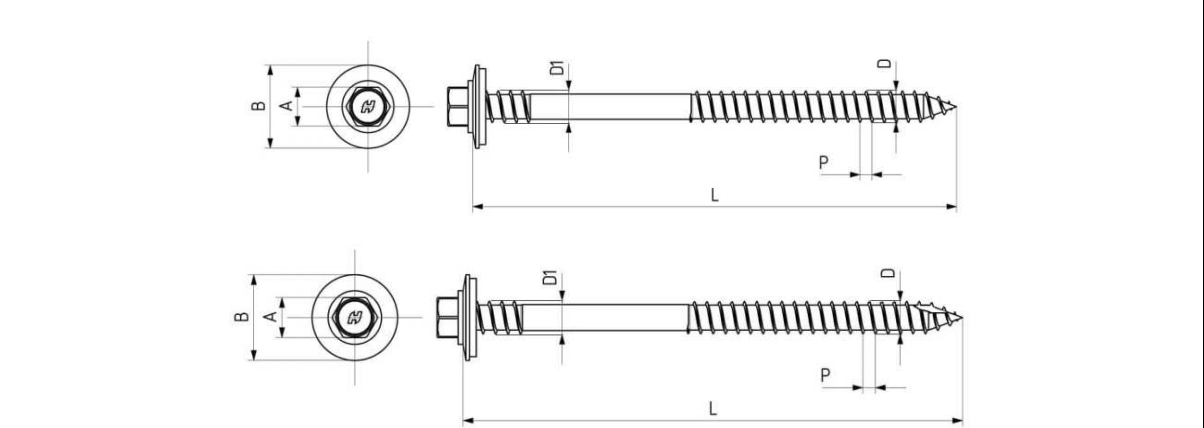
WKSPW PROTECT (H) 5,5/6,3-20 x L
 with hexagon head and steel sealing washer $\geq \text{Ø}19$ mm

Annex 11
 of European
 Technical Assessment
 ETA-13/0421

Materials:
 Fastener: carbon steel – SAE 1022, quenched, tempered and galvanized ($\geq 12 \mu\text{m}$)
 Washer: metallic washer made of zinc-coated carbon steel with EPDM sealing ring
 Component I: S280GD, S320GD or S350GD – EN 10346
 Component II: structural timber – EN 14081

Drilling capacity: -

Timber substructure
 For timber substructures performance determined with
 $M_{y,Rk} = 9,660 \text{ Nm}$
 $f_{ax,k} = 16,627 \text{ N/mm}^2$ for $l_{ef} \geq 20 \text{ mm}$



| Effective length $l_{ef} \geq 20 \text{ mm}$ | | Component II: wood class $\geq \text{C24}$ Thickness of sandwich panel in the fixing point | | | | | | | | | | | | |
|--|-------------------|---|-------|-------|-------|-------|-------|-------|-------|--------|--------|---------------|------|------|
| | | 20,00 | 30,00 | 40,00 | 50,00 | 60,00 | 70,00 | 80,00 | 90,00 | 100,00 | 120,00 | $\geq 140,00$ | | |
| Component I: $t_{N,1}$ or $t_{N,2}$ in [mm] | $V_{R,k}$ in [kN] | 0,40 | 0,82 | 0,82 | 0,82 | 0,82 | 0,82 | 0,82 | 0,82 | 0,82 | 0,82 | 0,82 | 0,82 | 0,82 |
| | | 0,50 | 1,48 | 1,48 | 1,48 | 1,48 | 1,48 | 1,48 | 1,48 | 1,48 | 1,48 | 1,48 | 1,48 | 1,48 |
| | | 0,55 | 1,48 | 1,48 | 1,48 | 1,48 | 1,48 | 1,48 | 1,48 | 1,48 | 1,48 | 1,48 | 1,48 | 1,48 |
| | | 0,63 | 1,65 | 1,65 | 1,65 | 1,65 | 1,65 | 1,65 | 1,65 | 1,65 | 1,65 | 1,65 | 1,65 | 1,65 |
| | | 0,75 | 1,90 | 1,90 | 1,90 | 1,90 | 1,90 | 1,90 | 1,90 | 1,90 | 1,90 | 1,90 | 1,90 | 1,90 |
| | | 0,88 | 1,90 | 1,90 | 1,90 | 1,90 | 1,90 | 1,90 | 1,90 | 1,90 | 1,90 | 1,90 | 1,90 | 1,90 |
| | | 1,00 | 1,90 | 1,90 | 1,90 | 1,90 | 1,90 | 1,90 | 1,90 | 1,90 | 1,90 | 1,90 | 1,90 | 1,90 |
| | $N_{R,k}$ in [kN] | 0,40 | 1,65 | 1,65 | 1,65 | 1,65 | 1,65 | 1,65 | 1,65 | 1,65 | 1,65 | 1,65 | 1,65 | 1,65 |
| | | 0,50 | 2,16 | 2,80 | 2,80 | 2,80 | 2,80 | 2,80 | 2,80 | 2,80 | 2,80 | 2,80 | 2,80 | 2,80 |
| | | 0,55 | 2,16 | 2,80 | 2,80 | 2,80 | 2,80 | 2,80 | 2,80 | 2,80 | 2,80 | 2,80 | 2,80 | 2,80 |
| | | 0,63 | 2,16 | 3,43 | 3,43 | 3,43 | 3,43 | 3,43 | 3,43 | 3,43 | 3,43 | 3,43 | 3,43 | 3,43 |
| | | 0,75 | 2,16 | 3,43 | 3,43 | 3,43 | 3,43 | 3,43 | 3,43 | 3,43 | 3,43 | 3,43 | 3,43 | 3,43 |
| | | 0,88 | 2,16 | 3,43 | 3,43 | 3,43 | 3,43 | 3,43 | 3,43 | 3,43 | 3,43 | 3,43 | 3,43 | 3,43 |
| | | 1,00 | 2,16 | 3,43 | 3,43 | 3,43 | 3,43 | 3,43 | 3,43 | 3,43 | 3,43 | 3,43 | 3,43 | 3,43 |
| max. head displacement u depending on the sandwich panel thickness in [mm] | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | | |

WKSPW
Fastening screws for sandwich panels

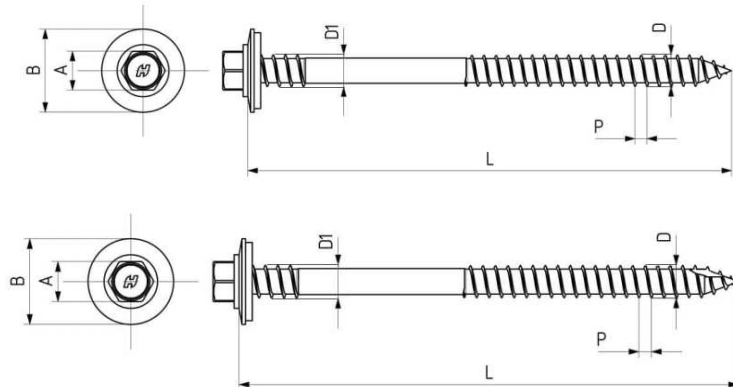
WKSPW (H) 6,5 x L
 with hexagon head and steel sealing washer $\text{Ø}16 \text{ mm}$

Annex 12
 of European
 Technical Assessment
 ETA-13/0421

Materials:
 Fastener: carbon steel – SAE 1022, quenched, tempered and galvanized ($\geq 12 \mu\text{m}$)
 Washer: metallic washer made of zinc-coated carbon steel with EPDM sealing ring
 Component I: S280GD, S320GD or S350GD – EN 10346
 Component II: structural timber – EN 14081

Drilling capacity: -

Timber substructure
 For timber substructures performance determined with
 $M_{y,Rk} = 9,660 \text{ Nm}$
 $f_{ax,k} = 16,627 \text{ N/mm}^2$ for $l_{ef} \geq 20 \text{ mm}$



| Effective length $l_{ef} \geq 20 \text{ mm}$ | | Component II: wood class $\geq \text{C24}$ Thickness of sandwich panel in the fixing point | | | | | | | | | | | | |
|--|-------------------|---|-------|-------|-------|-------|-------|-------|-------|--------|--------|---------------|------|------|
| | | 20,00 | 30,00 | 40,00 | 50,00 | 60,00 | 70,00 | 80,00 | 90,00 | 100,00 | 120,00 | $\geq 140,00$ | | |
| Component I: $t_{N,1}$ or $t_{N,2}$ in [mm] | $V_{R,k}$ in [kN] | 0,40 | 0,82 | 0,82 | 0,82 | 0,82 | 0,82 | 0,82 | 0,82 | 0,82 | 0,82 | 0,82 | 0,82 | 0,82 |
| | | 0,50 | 1,48 | 1,48 | 1,48 | 1,48 | 1,48 | 1,48 | 1,48 | 1,48 | 1,48 | 1,48 | 1,48 | 1,48 |
| | | 0,55 | 1,48 | 1,48 | 1,48 | 1,48 | 1,48 | 1,48 | 1,48 | 1,48 | 1,48 | 1,48 | 1,48 | 1,48 |
| | | 0,63 | 1,65 | 1,65 | 1,65 | 1,65 | 1,65 | 1,65 | 1,65 | 1,65 | 1,65 | 1,65 | 1,65 | 1,65 |
| | | 0,75 | 1,90 | 1,90 | 1,90 | 1,90 | 1,90 | 1,90 | 1,90 | 1,90 | 1,90 | 1,90 | 1,90 | 1,90 |
| | | 0,88 | 1,90 | 1,90 | 1,90 | 1,90 | 1,90 | 1,90 | 1,90 | 1,90 | 1,90 | 1,90 | 1,90 | 1,90 |
| | | 1,00 | 1,90 | 1,90 | 1,90 | 1,90 | 1,90 | 1,90 | 1,90 | 1,90 | 1,90 | 1,90 | 1,90 | 1,90 |
| | $N_{R,k}$ in [kN] | 0,40 | 1,84 | 1,84 | 1,84 | 1,84 | 1,84 | 1,84 | 1,84 | 1,84 | 1,84 | 1,84 | 1,84 | 1,84 |
| | | 0,50 | 2,16 | 3,36 | 3,36 | 3,36 | 3,36 | 3,36 | 3,36 | 3,36 | 3,36 | 3,36 | 3,36 | 3,36 |
| | | 0,55 | 2,16 | 3,36 | 3,36 | 3,36 | 3,36 | 3,36 | 3,36 | 3,36 | 3,36 | 3,36 | 3,36 | 3,36 |
| | | 0,63 | 2,16 | 3,43 | 3,43 | 3,43 | 3,43 | 3,43 | 3,43 | 3,43 | 3,43 | 3,43 | 3,43 | 3,43 |
| | | 0,75 | 2,16 | 3,43 | 3,43 | 3,43 | 3,43 | 3,43 | 3,43 | 3,43 | 3,43 | 3,43 | 3,43 | 3,43 |
| | | 0,88 | 2,16 | 3,43 | 3,43 | 3,43 | 3,43 | 3,43 | 3,43 | 3,43 | 3,43 | 3,43 | 3,43 | 3,43 |
| | | 1,00 | 2,16 | 3,43 | 3,43 | 3,43 | 3,43 | 3,43 | 3,43 | 3,43 | 3,43 | 3,43 | 3,43 | 3,43 |
| max. head displacement u depending on the sandwich panel thickness in [mm] | | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | |

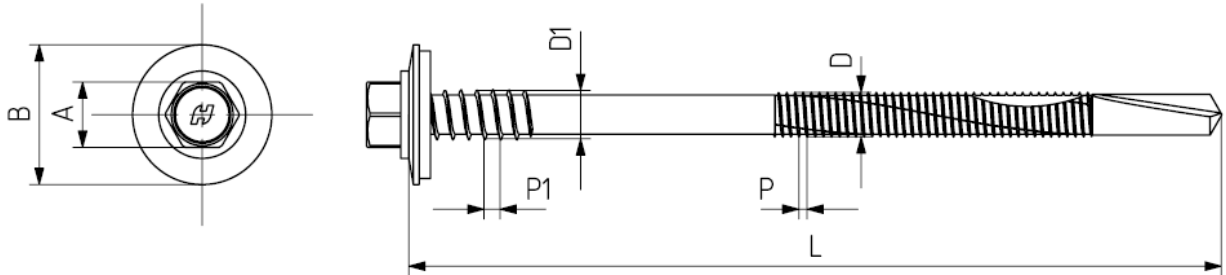
| | |
|--|---|
| WKSPW Fastening screws for sandwich panels | Annex 13 of European Technical Assessment ETA-13/0421 |
| WKSPW (H) 6,5 x L with hexagon head and steel sealing washer $\geq \text{Ø}19 \text{ mm}$ | |

Materials:

Fastener: carbon steel – SAE 1022, quenched, tempered and galvanized ($\geq 12 \mu\text{m}$)
 Washer: metallic washer made of zinc-coated carbon steel with EPDM sealing ring
 Component I: S280GD, S320GD or S350GD – EN 10346
 Component II: S235 – EN 10025-1, S280GD, S320GD or S350GD – EN 10346

Drilling capacity: $\Sigma(t_{N2} + t_{t1}) \leq 12 \text{ mm}$

Timber substructure
 No performance assessed



| Component II: t_{t1} in [mm] | | 4,00 | 5,00 | 6,00 | 8,00 | 10,00 | 11,00 | 14,00 | $\geq 16,00$ | |
|--|-------------------|------|------|------|------|-------|-------|-------|--------------|---|
| Component I: t_{N1} or t_{N2} in [mm] | $V_{R,k}$ in [kN] | 0,40 | 0,85 | 0,85 | 0,85 | 0,85 | 0,85 | 0,85 | — | — |
| | | 0,50 | 1,40 | 1,40 | 1,40 | 1,40 | 1,40 | 1,40 | — | — |
| | | 0,55 | 1,40 | 1,40 | 1,40 | 1,40 | 1,40 | 1,40 | — | — |
| | | 0,63 | 1,70 | 1,70 | 1,70 | 1,70 | 1,70 | 1,70 | — | — |
| | | 0,75 | 1,98 | 1,98 | 1,98 | 1,98 | 1,98 | 1,98 | — | — |
| | | 0,88 | 1,98 | 1,98 | 1,98 | 1,98 | 1,98 | 1,98 | — | — |
| | | 1,00 | 1,98 | 1,98 | 1,98 | 1,98 | 1,98 | 1,98 | — | — |
| | $N_{R,k}$ in [kN] | 0,40 | 1,65 | 1,65 | 1,65 | 1,65 | 1,65 | 1,65 | — | — |
| | | 0,50 | 2,80 | 2,80 | 2,80 | 2,80 | 2,80 | 2,80 | — | — |
| | | 0,55 | 2,80 | 2,80 | 2,80 | 2,80 | 2,80 | 2,80 | — | — |
| | | 0,63 | 3,60 | 3,60 | 3,60 | 3,60 | 3,60 | 3,60 | — | — |
| | | 0,75 | 4,31 | 4,31 | 4,31 | 4,31 | 4,31 | 4,31 | — | — |
| | | 0,88 | 4,31 | 4,31 | 4,31 | 4,31 | 4,31 | 4,31 | — | — |
| | | 1,00 | 4,31 | 4,31 | 4,31 | 4,31 | 4,31 | 4,31 | — | — |
| max. head displacement u depending on the sandwich panel thickness in [mm] | 30 | 0,7 | 0,7 | 0,7 | 0,7 | 0,7 | 0,7 | — | — | |
| | 40 | 0,7 | 0,7 | 0,7 | 0,7 | 0,7 | 0,7 | — | — | |
| | 50 | 0,7 | 0,7 | 0,7 | 0,7 | 0,7 | 0,7 | — | — | |
| | 60 | 2 | 2 | 2 | 2 | 2 | 2 | — | — | |
| | 70 | 2 | 2 | 2 | 2 | 2 | 2 | — | — | |
| | 80 | 2 | 2 | 2 | 2 | 2 | 2 | — | — | |
| | 90 | 3 | 3 | 3 | 3 | 3 | 3 | — | — | |
| | 100 | 3 | 3 | 3 | 3 | 3 | 3 | — | — | |
| | 120 | 3 | 3 | 3 | 3 | 3 | 3 | — | — | |
| ≥ 140 | 3 | 3 | 3 | 3 | 3 | 3 | — | — | | |

WKSPW
Fastening screws for sandwich panels

WKSPW (H) 5,5/6,3-12 x L
 with hexagon head and steel sealing washer $\varnothing 16 \text{ mm}$

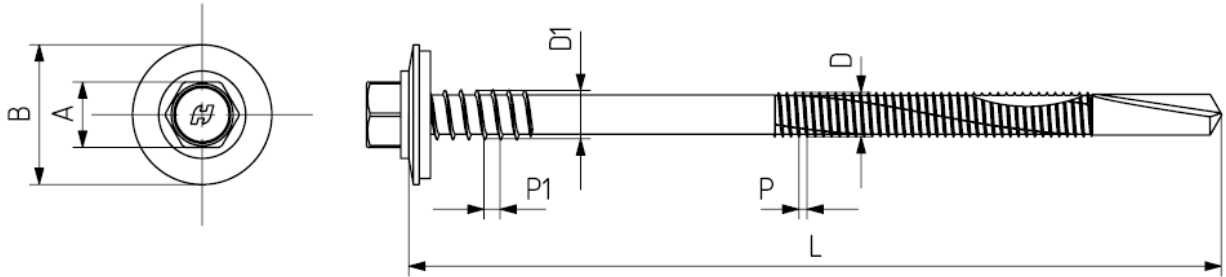
Annex 14
 of European
 Technical Assessment
 ETA-13/0421

Materials:

Fastener: carbon steel – SAE 1022, quenched, tempered and galvanized ($\geq 12 \mu\text{m}$)
 Washer: metallic washer made of zinc-coated carbon steel with EPDM sealing ring
 Component I: S280GD, S320GD or S350GD – EN 10346
 Component II: S235 – EN 10025-1, S280GD, S320GD or S350GD – EN 10346

Drilling capacity: $\Sigma(t_{N2} + t_{I1}) \leq 12 \text{ mm}$

Timber substructure
 No performance assessed



| Component II: t_{II} in [mm] | | 4,00 | 5,00 | 6,00 | 8,00 | 10,00 | 11,00 | 14,00 | $\geq 16,00$ | |
|--|-------------------|------|------|------|------|-------|-------|-------|--------------|---|
| Component I: t_{N1} or t_{N2} in [mm] | $V_{R,k}$ in [kN] | 0,40 | 0,85 | 0,85 | 0,85 | 0,85 | 0,85 | 0,85 | — | — |
| | | 0,50 | 1,40 | 1,40 | 1,40 | 1,40 | 1,40 | 1,40 | — | — |
| | | 0,55 | 1,40 | 1,40 | 1,40 | 1,40 | 1,40 | 1,40 | — | — |
| | | 0,63 | 1,70 | 1,70 | 1,70 | 1,70 | 1,70 | 1,70 | — | — |
| | | 0,75 | 1,98 | 1,98 | 1,98 | 1,98 | 1,98 | 1,98 | — | — |
| | | 0,88 | 1,98 | 1,98 | 1,98 | 1,98 | 1,98 | 1,98 | — | — |
| | | 1,00 | 1,98 | 1,98 | 1,98 | 1,98 | 1,98 | 1,98 | — | — |
| | $N_{R,k}$ in [kN] | 0,40 | 1,84 | 1,84 | 1,84 | 1,84 | 1,84 | 1,84 | — | — |
| | | 0,50 | 3,36 | 3,36 | 3,36 | 3,36 | 3,36 | 3,36 | — | — |
| | | 0,55 | 3,36 | 3,36 | 3,36 | 3,36 | 3,36 | 3,36 | — | — |
| | | 0,63 | 4,12 | 4,12 | 4,12 | 4,12 | 4,12 | 4,12 | — | — |
| | | 0,75 | 5,41 | 5,41 | 5,41 | 5,41 | 5,41 | 5,41 | — | — |
| | | 0,88 | 5,41 | 5,41 | 5,41 | 5,41 | 5,41 | 5,41 | — | — |
| | | 1,00 | 5,41 | 5,41 | 5,41 | 5,41 | 5,41 | 5,41 | — | — |
| max. head displacement u depending on the sandwich panel thickness in [mm] | 30 | 0,7 | 0,7 | 0,7 | 0,7 | 0,7 | 0,7 | — | — | |
| | 40 | 0,7 | 0,7 | 0,7 | 0,7 | 0,7 | 0,7 | — | — | |
| | 50 | 0,7 | 0,7 | 0,7 | 0,7 | 0,7 | 0,7 | — | — | |
| | 60 | 2 | 2 | 2 | 2 | 2 | 2 | — | — | |
| | 70 | 2 | 2 | 2 | 2 | 2 | 2 | — | — | |
| | 80 | 2 | 2 | 2 | 2 | 2 | 2 | — | — | |
| | 90 | 3 | 3 | 3 | 3 | 3 | 3 | — | — | |
| | 100 | 3 | 3 | 3 | 3 | 3 | 3 | — | — | |
| | 120 | 3 | 3 | 3 | 3 | 3 | 3 | — | — | |
| | ≥ 140 | 3 | 3 | 3 | 3 | 3 | 3 | — | — | |

WKSPW
Fastening screws for sandwich panels

WKSPW (H) 5,5/6,3-12 x L
 with hexagon head and steel sealing washer $\geq \text{Ø}19 \text{ mm}$

Annex 15
 of European
 Technical Assessment
 ETA-13/0421

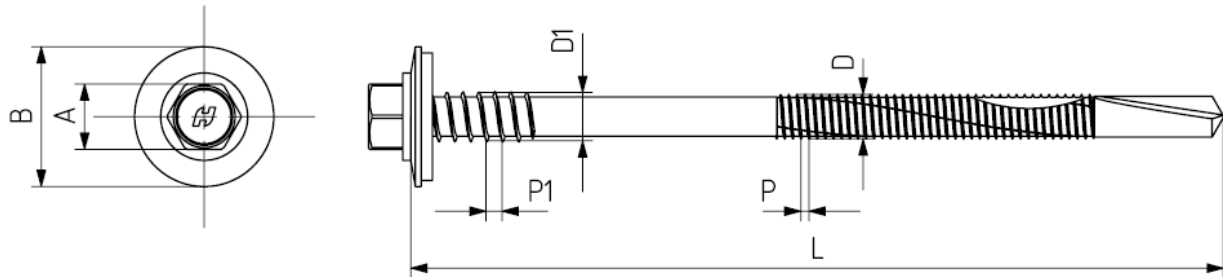
Materials:

Fastener: carbon steel – SAE 1022, quenched, tempered and galvanized, additional coating PROTECT
 Washer: metallic washer made of zinc-coated carbon steel with EPDM sealing ring
 Component I: S280GD, S320GD or S350GD – EN 10346
 Component II: S235 – EN 10025-1, S280GD, S320GD or S350GD – EN 10346

Drilling capacity: $\Sigma(t_{N2} + t_{II}) \leq 12$ mm

Timber substructure

No performance assessed



| Component II: t_{II} in [mm] | | 4,00 | 5,00 | 6,00 | 8,00 | 10,00 | 11,00 | 14,00 | ≥ 16,00 | |
|--|-------------------|------|------|------|------|-------|-------|-------|---------|---|
| Component I: $t_{N,1}$ or $t_{N,2}$ in [mm] | $V_{R,k}$ in [kN] | 0,40 | 0,85 | 0,85 | 0,85 | 0,85 | 0,85 | 0,85 | — | — |
| | | 0,50 | 1,40 | 1,40 | 1,40 | 1,40 | 1,40 | 1,40 | — | — |
| | | 0,55 | 1,40 | 1,40 | 1,40 | 1,40 | 1,40 | 1,40 | — | — |
| | | 0,63 | 1,70 | 1,70 | 1,70 | 1,70 | 1,70 | 1,70 | — | — |
| | | 0,75 | 1,98 | 1,98 | 1,98 | 1,98 | 1,98 | 1,98 | — | — |
| | | 0,88 | 1,98 | 1,98 | 1,98 | 1,98 | 1,98 | 1,98 | — | — |
| | | 1,00 | 1,98 | 1,98 | 1,98 | 1,98 | 1,98 | 1,98 | — | — |
| | $N_{R,k}$ in [kN] | 0,40 | 1,65 | 1,65 | 1,65 | 1,65 | 1,65 | 1,65 | — | — |
| | | 0,50 | 2,80 | 2,80 | 2,80 | 2,80 | 2,80 | 2,80 | — | — |
| | | 0,55 | 2,80 | 2,80 | 2,80 | 2,80 | 2,80 | 2,80 | — | — |
| | | 0,63 | 3,60 | 3,60 | 3,60 | 3,60 | 3,60 | 3,60 | — | — |
| | | 0,75 | 4,31 | 4,31 | 4,31 | 4,31 | 4,31 | 4,31 | — | — |
| | | 0,88 | 4,31 | 4,31 | 4,31 | 4,31 | 4,31 | 4,31 | — | — |
| | | 1,00 | 4,31 | 4,31 | 4,31 | 4,31 | 4,31 | 4,31 | — | — |
| max. head displacement u depending on the sandwich panel thickness in [mm] | 30 | 0,7 | 0,7 | 0,7 | 0,7 | 0,7 | 0,7 | — | — | |
| | 40 | 0,7 | 0,7 | 0,7 | 0,7 | 0,7 | 0,7 | — | — | |
| | 50 | 0,7 | 0,7 | 0,7 | 0,7 | 0,7 | 0,7 | — | — | |
| | 60 | 2 | 2 | 2 | 2 | 2 | 2 | — | — | |
| | 70 | 2 | 2 | 2 | 2 | 2 | 2 | — | — | |
| | 80 | 2 | 2 | 2 | 2 | 2 | 2 | — | — | |
| | 90 | 3 | 3 | 3 | 3 | 3 | 3 | — | — | |
| | 100 | 3 | 3 | 3 | 3 | 3 | 3 | — | — | |
| | 120 | 3 | 3 | 3 | 3 | 3 | 3 | — | — | |
| | ≥140 | 3 | 3 | 3 | 3 | 3 | 3 | — | — | |

WKSPW
Fastening screws for sandwich panels

WKSPW PROTECT (H) 5,5/6,3-12 x L
 with hexagon head and steel sealing washer Ø16 mm

Annex 16
 of European
 Technical Assessment
 ETA-13/0421

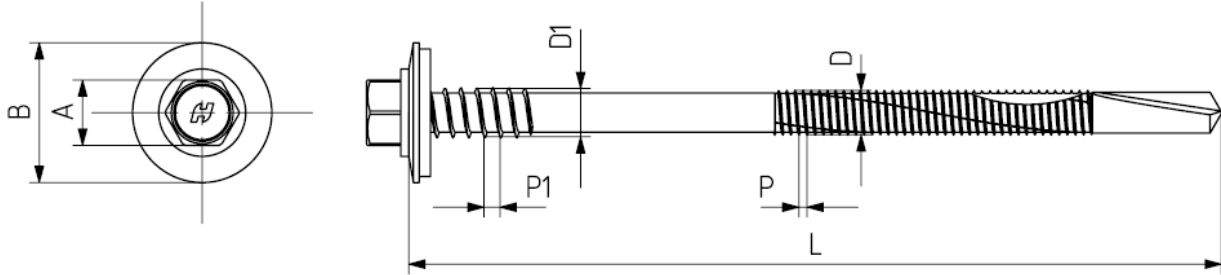
Materials:

Fastener: carbon steel – SAE 1022, quenched, tempered and galvanized, additional coating PROTECT
 Washer: metallic washer made of zinc-coated carbon steel with EPDM sealing ring
 Component I: S280GD, S320GD or S350GD – EN 10346
 Component II: S235 – EN 10025-1, S280GD, S320GD or S350GD – EN 10346

Drilling capacity: $\Sigma(t_{N2} + t_{II}) \leq 12$ mm

Timber substructure

No performance assessed



| Component II: t_{II} in [mm] | | 4,00 | 5,00 | 6,00 | 8,00 | 10,00 | 11,00 | 14,00 | ≥ 16,00 | |
|--|-------------------|------|------|------|------|-------|-------|-------|---------|---|
| Component I: t_{N1} or t_{N2} in [mm] | $V_{R,k}$ in [kN] | 0,40 | 0,85 | 0,85 | 0,85 | 0,85 | 0,85 | 0,85 | — | — |
| | | 0,50 | 1,40 | 1,40 | 1,40 | 1,40 | 1,40 | 1,40 | — | — |
| | | 0,55 | 1,40 | 1,40 | 1,40 | 1,40 | 1,40 | 1,40 | — | — |
| | | 0,63 | 1,70 | 1,70 | 1,70 | 1,70 | 1,70 | 1,70 | — | — |
| | | 0,75 | 1,98 | 1,98 | 1,98 | 1,98 | 1,98 | 1,98 | — | — |
| | | 0,88 | 1,98 | 1,98 | 1,98 | 1,98 | 1,98 | 1,98 | — | — |
| | | 1,00 | 1,98 | 1,98 | 1,98 | 1,98 | 1,98 | 1,98 | — | — |
| | $N_{R,k}$ in [kN] | 0,40 | 1,84 | 1,84 | 1,84 | 1,84 | 1,84 | 1,84 | — | — |
| | | 0,50 | 3,36 | 3,36 | 3,36 | 3,36 | 3,36 | 3,36 | — | — |
| | | 0,55 | 3,36 | 3,36 | 3,36 | 3,36 | 3,36 | 3,36 | — | — |
| | | 0,63 | 4,12 | 4,12 | 4,12 | 4,12 | 4,12 | 4,12 | — | — |
| | | 0,75 | 5,41 | 5,41 | 5,41 | 5,41 | 5,41 | 5,41 | — | — |
| | | 0,88 | 5,41 | 5,41 | 5,41 | 5,41 | 5,41 | 5,41 | — | — |
| | | 1,00 | 5,41 | 5,41 | 5,41 | 5,41 | 5,41 | 5,41 | — | — |
| max. head displacement u depending on the sandwich panel thickness in [mm] | 30 | 0,7 | 0,7 | 0,7 | 0,7 | 0,7 | 0,7 | — | — | |
| | 40 | 0,7 | 0,7 | 0,7 | 0,7 | 0,7 | 0,7 | — | — | |
| | 50 | 0,7 | 0,7 | 0,7 | 0,7 | 0,7 | 0,7 | — | — | |
| | 60 | 2 | 2 | 2 | 2 | 2 | 2 | — | — | |
| | 70 | 2 | 2 | 2 | 2 | 2 | 2 | — | — | |
| | 80 | 2 | 2 | 2 | 2 | 2 | 2 | — | — | |
| | 90 | 3 | 3 | 3 | 3 | 3 | 3 | — | — | |
| | 100 | 3 | 3 | 3 | 3 | 3 | 3 | — | — | |
| | 120 | 3 | 3 | 3 | 3 | 3 | 3 | — | — | |
| | ≥140 | 3 | 3 | 3 | 3 | 3 | 3 | — | — | |

**WKSPW
Fastening screws for sandwich panels**

WKSPW PROTECT (H) 5,5/6,3-12 x L
with hexagon head and steel sealing washer $\geq \text{Ø}19$ mm

Annex 17
of European
Technical Assessment
ETA-13/0421

Materials:
 Fastener: carbon steel – SAE 1022, quenched, tempered and galvanized, additional coating PROTECT
 Washer: metallic washer made of stainless steel with EPDM sealing ring
 Component I: S280GD, S320GD or S350GD – EN 10346
 Component II: S235 – EN 10025-1, S280GD, S320GD or S350GD – EN 10346

Drilling capacity: $\Sigma(t_{N2} + t_{II}) \leq 12$ mm

Timber substructure
 No performance assessed

| Component II: t_{II} in [mm] | | 4,00 | 5,00 | 6,00 | 8,00 | 10,00 | 11,00 | 14,00 | $\geq 16,00$ | |
|--|-------------------|------|------|------|------|-------|-------|-------|--------------|---|
| Component I: t_{N1} or t_{N2} in [mm] | $V_{R,k}$ in [kN] | 0,40 | 0,85 | 0,85 | 0,85 | 0,85 | 0,85 | 0,85 | — | — |
| | | 0,50 | 1,40 | 1,40 | 1,40 | 1,40 | 1,40 | 1,40 | — | — |
| | | 0,55 | 1,40 | 1,40 | 1,40 | 1,40 | 1,40 | 1,40 | — | — |
| | | 0,63 | 1,70 | 1,70 | 1,70 | 1,70 | 1,70 | 1,70 | — | — |
| | | 0,75 | 1,98 | 1,98 | 1,98 | 1,98 | 1,98 | 1,98 | — | — |
| | | 0,88 | 1,98 | 1,98 | 1,98 | 1,98 | 1,98 | 1,98 | — | — |
| | | 1,00 | 1,98 | 1,98 | 1,98 | 1,98 | 1,98 | 1,98 | — | — |
| | $N_{R,k}$ in [kN] | 0,40 | 1,65 | 1,65 | 1,65 | 1,65 | 1,65 | 1,65 | — | — |
| | | 0,50 | 2,80 | 2,80 | 2,80 | 2,80 | 2,80 | 2,80 | — | — |
| | | 0,55 | 2,80 | 2,80 | 2,80 | 2,80 | 2,80 | 2,80 | — | — |
| | | 0,63 | 3,60 | 3,60 | 3,60 | 3,60 | 3,60 | 3,60 | — | — |
| | | 0,75 | 4,31 | 4,31 | 4,31 | 4,31 | 4,31 | 4,31 | — | — |
| | | 0,88 | 4,31 | 4,31 | 4,31 | 4,31 | 4,31 | 4,31 | — | — |
| | | 1,00 | 4,31 | 4,31 | 4,31 | 4,31 | 4,31 | 4,31 | — | — |
| max. head displacement u depending on the sandwich panel thickness in [mm] | 30 | 0,7 | 0,7 | 0,7 | 0,7 | 0,7 | 0,7 | — | — | |
| | 40 | 0,7 | 0,7 | 0,7 | 0,7 | 0,7 | 0,7 | — | — | |
| | 50 | 0,7 | 0,7 | 0,7 | 0,7 | 0,7 | 0,7 | — | — | |
| | 60 | 2 | 2 | 2 | 2 | 2 | 2 | — | — | |
| | 70 | 2 | 2 | 2 | 2 | 2 | 2 | — | — | |
| | 80 | 2 | 2 | 2 | 2 | 2 | 2 | — | — | |
| | 90 | 3 | 3 | 3 | 3 | 3 | 3 | — | — | |
| | 100 | 3 | 3 | 3 | 3 | 3 | 3 | — | — | |
| | 120 | 3 | 3 | 3 | 3 | 3 | 3 | — | — | |
| | ≥ 140 | 3 | 3 | 3 | 3 | 3 | 3 | — | — | |

| | |
|--|---|
| WKSPW Fastening screws for sandwich panels | Annex 18 of European Technical Assessment ETA-13/0421 |
| WKSPW PROTECT (H) 5,5/6,3-12 x L with hexagon head and steel sealing washer $\varnothing 16$ mm | |

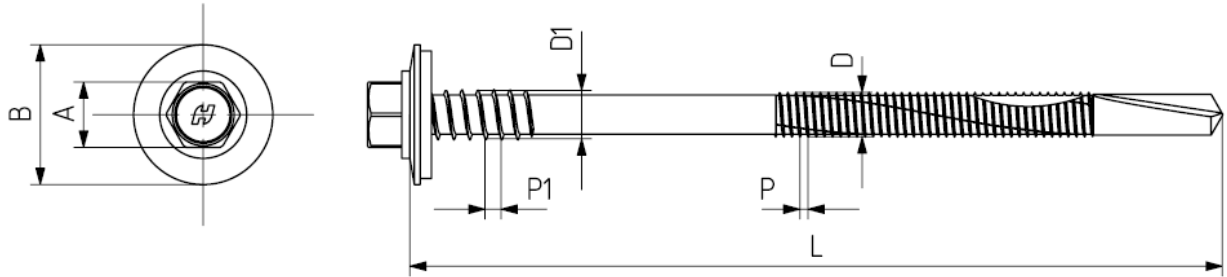
Materials:

Fastener: carbon steel – SAE 1022, quenched, tempered and galvanized, additional coating PROTECT
 Washer: metallic washer made of stainless steel with EPDM sealing ring
 Component I: S280GD, S320GD or S350GD – EN 10346
 Component II: S235 – EN 10025-1, S280GD, S320GD or S350GD – EN 10346

Drilling capacity: $\Sigma(t_{N2} + t_{II}) \leq 12$ mm

Timber substructure

No performance assessed



| Component II: t_{II} in [mm] | | 4,00 | 5,00 | 6,00 | 8,00 | 10,00 | 11,00 | 14,00 | ≥ 16,00 | |
|--|-------------------|-------------------|------|------|------|-------|-------|-------|---------|---|
| Component I: t_{N1} or t_{N2} in [mm] | $V_{R,k}$ in [kN] | 0,40 | 0,85 | 0,85 | 0,85 | 0,85 | 0,85 | 0,85 | — | — |
| | | 0,50 | 1,40 | 1,40 | 1,40 | 1,40 | 1,40 | 1,40 | — | — |
| | | 0,55 | 1,40 | 1,40 | 1,40 | 1,40 | 1,40 | 1,40 | — | — |
| | | 0,63 | 1,70 | 1,70 | 1,70 | 1,70 | 1,70 | 1,70 | — | — |
| | | 0,75 | 1,98 | 1,98 | 1,98 | 1,98 | 1,98 | 1,98 | — | — |
| | | 0,88 | 1,98 | 1,98 | 1,98 | 1,98 | 1,98 | 1,98 | — | — |
| | | 1,00 | 1,98 | 1,98 | 1,98 | 1,98 | 1,98 | 1,98 | — | — |
| | | $N_{R,k}$ in [kN] | 0,40 | 1,84 | 1,84 | 1,84 | 1,84 | 1,84 | 1,84 | — |
| 0,50 | 3,36 | | 3,36 | 3,36 | 3,36 | 3,36 | 3,36 | — | — | |
| 0,55 | 3,36 | | 3,36 | 3,36 | 3,36 | 3,36 | 3,36 | — | — | |
| 0,63 | 4,12 | | 4,12 | 4,12 | 4,12 | 4,12 | 4,12 | — | — | |
| 0,75 | 5,41 | | 5,41 | 5,41 | 5,41 | 5,41 | 5,41 | — | — | |
| 0,88 | 5,41 | | 5,41 | 5,41 | 5,41 | 5,41 | 5,41 | — | — | |
| 1,00 | 5,41 | | 5,41 | 5,41 | 5,41 | 5,41 | 5,41 | — | — | |
| max. head displacement u depending on the sandwich panel thickness in [mm] | 30 | | 0,7 | 0,7 | 0,7 | 0,7 | 0,7 | 0,7 | — | — |
| | 40 | 0,7 | 0,7 | 0,7 | 0,7 | 0,7 | 0,7 | — | — | |
| | 50 | 0,7 | 0,7 | 0,7 | 0,7 | 0,7 | 0,7 | — | — | |
| | 60 | 2 | 2 | 2 | 2 | 2 | 2 | — | — | |
| | 70 | 2 | 2 | 2 | 2 | 2 | 2 | — | — | |
| | 80 | 2 | 2 | 2 | 2 | 2 | 2 | — | — | |
| | 90 | 3 | 3 | 3 | 3 | 3 | 3 | — | — | |
| | 100 | 3 | 3 | 3 | 3 | 3 | 3 | — | — | |
| | 120 | 3 | 3 | 3 | 3 | 3 | 3 | — | — | |
| | ≥140 | 3 | 3 | 3 | 3 | 3 | 3 | — | — | |

**WKSPW
Fastening screws for sandwich panels**

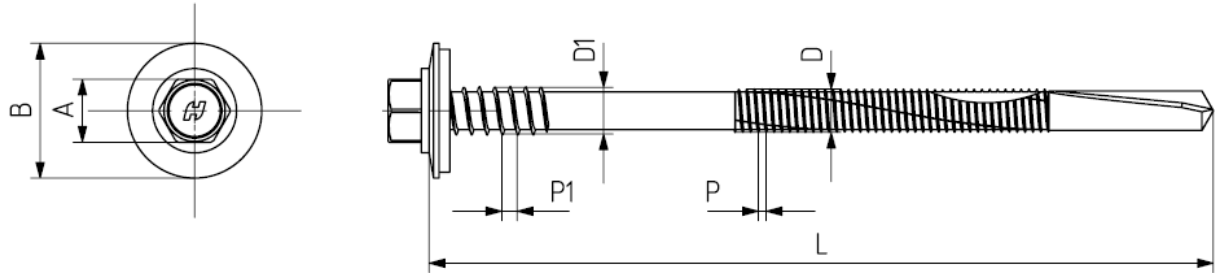
WKSPW PROTECT (H) 5,5/6,3-12 x L
with hexagon head and steel sealing washer $\geq \varnothing 19$ mm

Annex 19
of European
Technical Assessment
ETA-13/0421

Materials:
 Fastener: carbon steel – SAE 1022, quenched, tempered and galvanized, additional coating PROTECT
 Washer: metallic washer made of zinc-coated carbon steel with EPDM sealing ring
 Component I: S280GD, S320GD or S350GD – EN 10346
 Component II: S235 – EN 10025-1, S280GD, S320GD or S350GD – EN 10346

Drilling capacity: $\Sigma(t_{N2} + t_{II}) \leq 16$ mm

Timber substructure
 No performance assessed



| Component II: t_{II} in [mm] | | 4,00 | 5,00 | 6,00 | 8,00 | 10,00 | 11,00 | 14,00 | $\geq 16,00$ | |
|--|-------------------|------|------|------|------|-------|-------|-------|--------------|---|
| Component I: $t_{N,1}$ or $t_{N,2}$ in [mm] | $V_{R,k}$ in [kN] | 0,40 | — | — | 0,85 | 0,85 | 0,85 | — | — | |
| | | 0,50 | — | — | 1,40 | 1,40 | 1,40 | — | — | |
| | | 0,55 | — | — | 1,40 | 1,40 | 1,40 | — | — | |
| | | 0,63 | — | — | 1,70 | 1,70 | 1,70 | — | — | |
| | | 0,75 | — | — | 1,98 | 1,98 | 1,98 | — | — | |
| | | 0,88 | — | — | 1,98 | 1,98 | 1,98 | — | — | |
| | | 1,00 | — | — | 1,98 | 1,98 | 1,98 | — | — | |
| | $N_{R,k}$ in [kN] | 0,40 | — | — | — | 1,65 | 1,65 | 1,65 | — | — |
| | | 0,50 | — | — | — | 2,80 | 2,80 | 2,80 | — | — |
| | | 0,55 | — | — | — | 2,80 | 2,80 | 2,80 | — | — |
| | | 0,63 | — | — | — | 3,60 | 3,60 | 3,60 | — | — |
| | | 0,75 | — | — | — | 4,31 | 4,31 | 4,31 | — | — |
| | | 0,88 | — | — | — | 4,31 | 4,31 | 4,31 | — | — |
| | | 1,00 | — | — | — | 4,31 | 4,31 | 4,31 | — | — |
| max. head displacement u depending on the sandwich panel thickness in [mm] | 30 | — | — | — | 0,7 | 0,7 | 0,7 | — | — | |
| | 40 | — | — | — | 0,7 | 0,7 | 0,7 | — | — | |
| | 50 | — | — | — | 0,7 | 0,7 | 0,7 | — | — | |
| | 60 | — | — | — | 2 | 2 | 2 | — | — | |
| | 70 | — | — | — | 2 | 2 | 2 | — | — | |
| | 80 | — | — | — | 2 | 2 | 2 | — | — | |
| | 90 | — | — | — | 3 | 3 | 3 | — | — | |
| | 100 | — | — | — | 3 | 3 | 3 | — | — | |
| | 120 | — | — | — | 3 | 3 | 3 | — | — | |
| ≥ 140 | — | — | — | 3 | 3 | 3 | — | — | | |

WKSPW
Fastening screws for sandwich panels

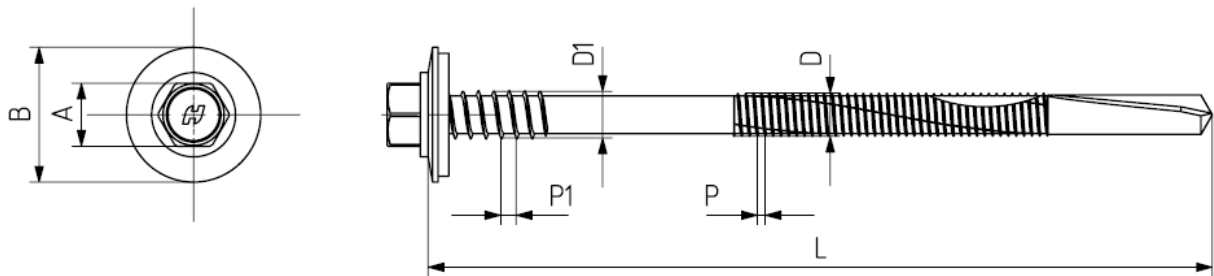
WKSPW PROTECT (H) 5,5/6,3-16 x L
 with hexagon head and steel sealing washer $\varnothing 16$ mm

Annex 20
 of European
 Technical Assessment
 ETA-13/0421

Materials:
 Fastener: carbon steel – SAE 1022, quenched, tempered and galvanized, additional coating PROTECT
 Washer: metallic washer made of zinc-coated carbon steel with EPDM sealing ring
 Component I: S280GD, S320GD or S350GD – EN 10346
 Component II: S235 – EN 10025-1, S280GD, S320GD or S350GD – EN 10346

Drilling capacity: $\Sigma(t_{N2} + t_{II}) \leq 16 \text{ mm}$

Timber substructure
 No performance assessed



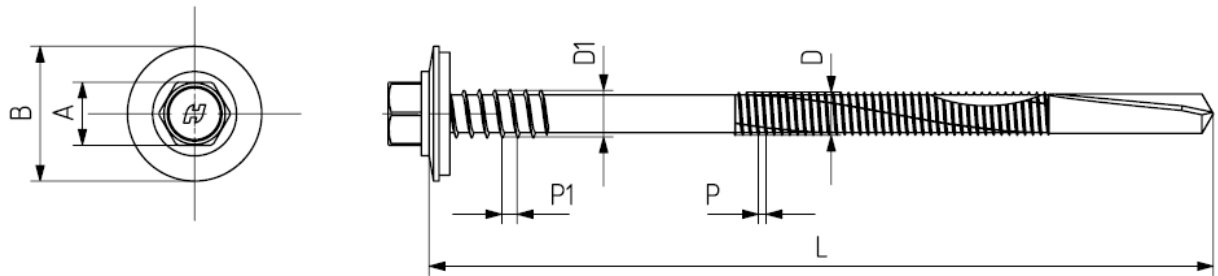
| Component II: t_{II} in [mm] | | 4,00 | 5,00 | 6,00 | 8,00 | 10,00 | 11,00 | 14,00 | $\geq 16,00$ | |
|--|-------------------|------|------|------|------|-------|-------|-------|--------------|---|
| Component I: t_{N1} or t_{N2} in [mm] | $V_{R,k}$ in [kN] | 0,40 | — | — | 0,85 | 0,85 | 0,85 | — | — | |
| | | 0,50 | — | — | 1,40 | 1,40 | 1,40 | — | — | |
| | | 0,55 | — | — | 1,40 | 1,40 | 1,40 | — | — | |
| | | 0,63 | — | — | 1,70 | 1,70 | 1,70 | — | — | |
| | | 0,75 | — | — | 1,98 | 1,98 | 1,98 | — | — | |
| | | 0,88 | — | — | 1,98 | 1,98 | 1,98 | — | — | |
| | | 1,00 | — | — | 1,98 | 1,98 | 1,98 | — | — | |
| | $N_{R,k}$ in [kN] | 0,40 | — | — | — | 1,84 | 1,84 | 1,84 | — | — |
| | | 0,50 | — | — | — | 3,36 | 3,36 | 3,36 | — | — |
| | | 0,55 | — | — | — | 3,36 | 3,36 | 3,36 | — | — |
| | | 0,63 | — | — | — | 4,12 | 4,12 | 4,12 | — | — |
| | | 0,75 | — | — | — | 5,41 | 5,41 | 5,41 | — | — |
| | | 0,88 | — | — | — | 5,41 | 5,41 | 5,41 | — | — |
| | | 1,00 | — | — | — | 5,41 | 5,41 | 5,41 | — | — |
| max. head displacement u depending on the sandwich panel thickness in [mm] | 30 | — | — | — | 0,7 | 0,7 | 0,7 | — | — | |
| | 40 | — | — | — | 0,7 | 0,7 | 0,7 | — | — | |
| | 50 | — | — | — | 0,7 | 0,7 | 0,7 | — | — | |
| | 60 | — | — | — | 2 | 2 | 2 | — | — | |
| | 70 | — | — | — | 2 | 2 | 2 | — | — | |
| | 80 | — | — | — | 2 | 2 | 2 | — | — | |
| | 90 | — | — | — | 3 | 3 | 3 | — | — | |
| | 100 | — | — | — | 3 | 3 | 3 | — | — | |
| | ≥ 140 | — | — | — | 3 | 3 | 3 | — | — | |

| | |
|---|---|
| WKSPW Fastening screws for sandwich panels | Annex 21 of European Technical Assessment ETA-13/0421 |
| WKSPW PROTECT (H) 5,5/6,3-16 x L with hexagon head and steel sealing washer $\geq \text{Ø}19 \text{ mm}$ | |

Materials:
 Fastener: carbon steel – SAE 1022, quenched, tempered and galvanized, additional coating PROTECT
 Washer: metallic washer made of stainless steel with EPDM sealing ring
 Component I: S280GD, S320GD or S350GD – EN 10346
 Component II: S235 – EN 10025-1, S280GD, S320GD or S350GD – EN 10346

Drilling capacity: $\Sigma(t_{N2} + t_{II}) \leq 16$ mm

Timber substructure
 No performance assessed



| Component II: t_{II} in [mm] | | 4,00 | 5,00 | 6,00 | 8,00 | 10,00 | 11,00 | 14,00 | $\geq 16,00$ | |
|--|-------------------|------|------|------|------|-------|-------|-------|--------------|---|
| Component I: t_{N1} or t_{N2} in [mm] | $V_{R,k}$ in [kN] | 0,40 | — | — | 0,85 | 0,85 | 0,85 | — | — | |
| | | 0,50 | — | — | 1,40 | 1,40 | 1,40 | — | — | |
| | | 0,55 | — | — | 1,40 | 1,40 | 1,40 | — | — | |
| | | 0,63 | — | — | 1,70 | 1,70 | 1,70 | — | — | |
| | | 0,75 | — | — | 1,98 | 1,98 | 1,98 | — | — | |
| | | 0,88 | — | — | 1,98 | 1,98 | 1,98 | — | — | |
| | | 1,00 | — | — | 1,98 | 1,98 | 1,98 | — | — | |
| | $N_{R,k}$ in [kN] | 0,40 | — | — | — | 1,65 | 1,65 | 1,65 | — | — |
| | | 0,50 | — | — | — | 2,80 | 2,80 | 2,80 | — | — |
| | | 0,55 | — | — | — | 2,80 | 2,80 | 2,80 | — | — |
| | | 0,63 | — | — | — | 3,60 | 3,60 | 3,60 | — | — |
| | | 0,75 | — | — | — | 4,31 | 4,31 | 4,31 | — | — |
| | | 0,88 | — | — | — | 4,31 | 4,31 | 4,31 | — | — |
| | | 1,00 | — | — | — | 4,31 | 4,31 | 4,31 | — | — |
| max. head displacement u depending on the sandwich panel thickness in [mm] | 30 | — | — | — | 0,7 | 0,7 | 0,7 | — | — | |
| | 40 | — | — | — | 0,7 | 0,7 | 0,7 | — | — | |
| | 50 | — | — | — | 0,7 | 0,7 | 0,7 | — | — | |
| | 60 | — | — | — | 2 | 2 | 2 | — | — | |
| | 70 | — | — | — | 2 | 2 | 2 | — | — | |
| | 80 | — | — | — | 2 | 2 | 2 | — | — | |
| | 90 | — | — | — | 3 | 3 | 3 | — | — | |
| | 100 | — | — | — | 3 | 3 | 3 | — | — | |
| | 120 | — | — | — | 3 | 3 | 3 | — | — | |
| ≥ 140 | — | — | — | 3 | 3 | 3 | — | — | | |

WKSPW
Fastening screws for sandwich panels

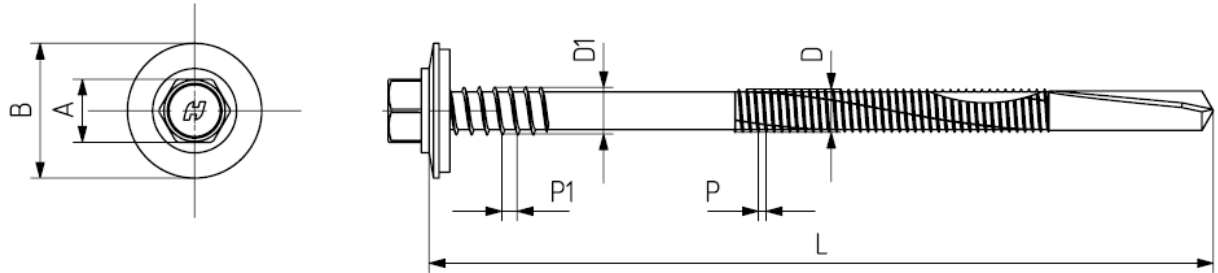
WKSPW PROTECT (H) 5,5/6,3-16 x L
 with hexagon head and stainless steel sealing washer $\varnothing 16$ mm

Annex 22
 of European
 Technical Assessment
 ETA-13/0421

Materials:
 Fastener: carbon steel – SAE 1022, quenched, tempered and galvanized, additional coating PROTECT
 Washer: metallic washer made of stainless steel with EPDM sealing ring
 Component I: S280GD, S320GD or S350GD – EN 10346
 Component II: S235 – EN 10025-1, S280GD, S320GD or S350GD – EN 10346

Drilling capacity: $\Sigma(t_{N2} + t_{II}) \leq 16$ mm

Timber substructure
 No performance assessed



| Component II: t_{II} in [mm] | | 4,00 | 5,00 | 6,00 | 8,00 | 10,00 | 11,00 | 14,00 | $\geq 16,00$ | |
|--|-------------------|------|------|------|------|-------|-------|-------|--------------|---|
| Component I: t_{N1} or t_{N2} in [mm] | $V_{R,k}$ in [kN] | 0,40 | — | — | 0,85 | 0,85 | 0,85 | — | — | |
| | | 0,50 | — | — | 1,40 | 1,40 | 1,40 | — | — | |
| | | 0,55 | — | — | 1,40 | 1,40 | 1,40 | — | — | |
| | | 0,63 | — | — | 1,70 | 1,70 | 1,70 | — | — | |
| | | 0,75 | — | — | 1,98 | 1,98 | 1,98 | — | — | |
| | | 0,88 | — | — | 1,98 | 1,98 | 1,98 | — | — | |
| | | 1,00 | — | — | 1,98 | 1,98 | 1,98 | — | — | |
| | $N_{R,k}$ in [kN] | 0,40 | — | — | — | 1,84 | 1,84 | 1,84 | — | — |
| | | 0,50 | — | — | — | 3,36 | 3,36 | 3,36 | — | — |
| | | 0,55 | — | — | — | 3,36 | 3,36 | 3,36 | — | — |
| | | 0,63 | — | — | — | 4,12 | 4,12 | 4,12 | — | — |
| | | 0,75 | — | — | — | 5,41 | 5,41 | 5,41 | — | — |
| | | 0,88 | — | — | — | 5,41 | 5,41 | 5,41 | — | — |
| | | 1,00 | — | — | — | 5,41 | 5,41 | 5,41 | — | — |
| max. head displacement u depending on the sandwich panel thickness in [mm] | 30 | — | — | — | 0,7 | 0,7 | 0,7 | — | — | |
| | 40 | — | — | — | 0,7 | 0,7 | 0,7 | — | — | |
| | 50 | — | — | — | 0,7 | 0,7 | 0,7 | — | — | |
| | 60 | — | — | — | 2 | 2 | 2 | — | — | |
| | 70 | — | — | — | 2 | 2 | 2 | — | — | |
| | 80 | — | — | — | 2 | 2 | 2 | — | — | |
| | 90 | — | — | — | 3 | 3 | 3 | — | — | |
| | 100 | — | — | — | 3 | 3 | 3 | — | — | |
| | 120 | — | — | — | 3 | 3 | 3 | — | — | |
| | ≥ 140 | — | — | — | 3 | 3 | 3 | — | — | |

WKSPW
Fastening screws for sandwich panels

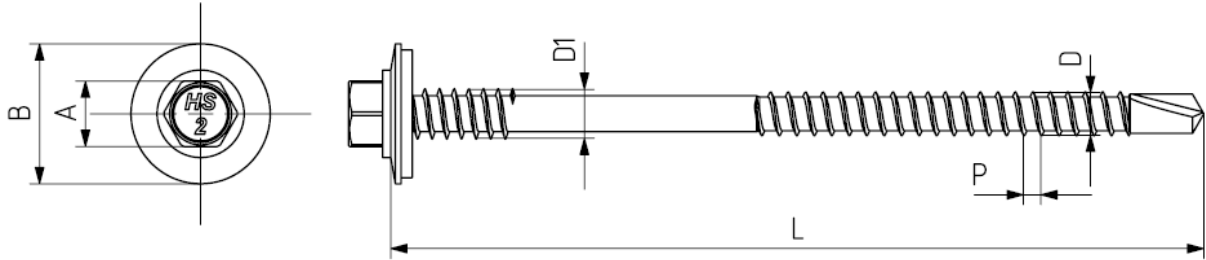
WKSPW PROTECT (H) 5,5/6,3-16 x L
 with hexagon head and stainless steel sealing washer $\geq \text{Ø}19$ mm

Annex 23
 of European
 Technical Assessment
 ETA-13/0421

Materials:
 Fastener: stainless steel – SAE 304, Bi-metal
 Washer: metallic washer made of stainless steel with EPDM sealing ring
 Component I: S280GD, S320GD or S350GD – EN 10346
 Component II: S235 – EN 10025-1, S280GD, S320GD or S350GD – EN 10346

Drilling capacity: $\Sigma(t_{N2} + t_{II}) \leq 6 \text{ mm}$

Timber substructure
 No performance assessed



| Component II: t_{II} in [mm] | | 2,00 | 2,50 | 3,00 | 4,00 | 5,00 | 6,00 | 8,00 | $\geq 10,00$ | |
|--|-------------------|------|------|------|------|------|------|------|--------------|---|
| Component I: t_{N1} or t_{N2} in [mm] | $V_{R,k}$ in [kN] | 0,40 | 0,82 | 0,82 | 0,82 | 0,82 | 0,82 | — | — | — |
| | | 0,50 | 1,48 | 1,48 | 1,48 | 1,48 | 1,48 | — | — | — |
| | | 0,55 | 1,48 | 1,48 | 1,48 | 1,48 | 1,48 | — | — | — |
| | | 0,63 | 1,65 | 1,65 | 1,65 | 1,65 | 1,65 | — | — | — |
| | | 0,75 | 1,90 | 1,90 | 1,90 | 1,90 | 1,90 | — | — | — |
| | | 0,88 | 1,90 | 1,90 | 1,90 | 1,90 | 1,90 | — | — | — |
| | | 1,00 | 1,90 | 1,90 | 1,90 | 1,90 | 1,90 | — | — | — |
| | $N_{R,k}$ in [kN] | 0,40 | 1,65 | 1,65 | 1,65 | 1,65 | 1,65 | — | — | — |
| | | 0,50 | 2,10 | 2,10 | 2,10 | 2,80 | 2,80 | — | — | — |
| | | 0,55 | 2,10 | 2,10 | 2,10 | 2,80 | 2,80 | — | — | — |
| | | 0,63 | 2,10 | 2,10 | 2,10 | 3,60 | 3,60 | — | — | — |
| | | 0,75 | 2,10 | 2,10 | 2,10 | 3,60 | 3,60 | — | — | — |
| | | 0,88 | 2,10 | 2,10 | 2,10 | 3,60 | 3,60 | — | — | — |
| | | 1,00 | 2,10 | 2,10 | 2,10 | 3,60 | 3,60 | — | — | — |
| max. head displacement u depending on the sandwich panel thickness in [mm] | 30 | 0,7 | 0,7 | 0,7 | 0,7 | 0,7 | — | — | — | |
| | 40 | 0,7 | 0,7 | 0,7 | 0,7 | 0,7 | — | — | — | |
| | 50 | 0,7 | 0,7 | 0,7 | 0,7 | 0,7 | — | — | — | |
| | 60 | 2 | 2 | 2 | 2 | 2 | — | — | — | |
| | 70 | 2 | 2 | 2 | 2 | 2 | — | — | — | |
| | 80 | 2 | 2 | 2 | 2 | 2 | — | — | — | |
| | 90 | 3 | 3 | 3 | 3 | 3 | — | — | — | |
| | 100 | 3 | 3 | 3 | 3 | 3 | — | — | — | |
| | 120 | 3 | 3 | 3 | 3 | 3 | — | — | — | |
| | ≥ 140 | 3 | 3 | 3 | 3 | 3 | — | — | — | |

WKSPW
Fastening screws for sandwich panels

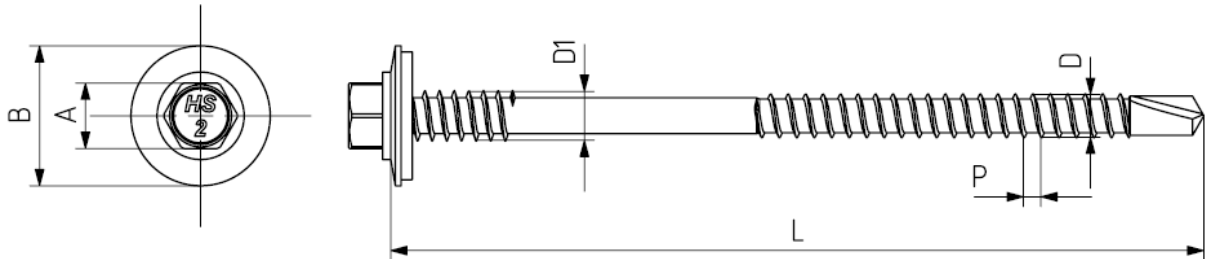
WKSPW (HS2) 5,5/6,3 x L
 with hexagon head and steel sealing washer $\varnothing 16 \text{ mm}$

Annex 24
 of European
 Technical Assessment
 ETA-13/0421

Materials:
 Fastener: stainless steel – SAE 304, Bi-metal
 Washer: metallic washer made of stainless steel with EPDM sealing ring
 Component I: S280GD, S320GD or S350GD – EN 10346
 Component II: S235 – EN 10025-1, S280GD, S320GD or S350GD – EN 10346

Drilling capacity: $\Sigma(t_{N2} + t_{II}) \leq 6 \text{ mm}$

Timber substructure
 No performance assessed



| Component II: t_{II} in [mm] | | 2,00 | 2,50 | 3,00 | 4,00 | 5,00 | 6,00 | 8,00 | $\geq 10,00$ | |
|--|-------------------|------|------|------|------|------|------|------|--------------|---|
| Component I: t_{N1} or t_{N2} in [mm] | $V_{R,k}$ in [kN] | 0,40 | 0,82 | 0,82 | 0,82 | 0,82 | 0,82 | — | — | — |
| | | 0,50 | 1,48 | 1,48 | 1,48 | 1,48 | 1,48 | — | — | — |
| | | 0,55 | 1,48 | 1,48 | 1,48 | 1,48 | 1,48 | — | — | — |
| | | 0,63 | 1,65 | 1,65 | 1,65 | 1,65 | 1,65 | — | — | — |
| | | 0,75 | 1,90 | 1,90 | 1,90 | 1,90 | 1,90 | — | — | — |
| | | 0,88 | 1,90 | 1,90 | 1,90 | 1,90 | 1,90 | — | — | — |
| | | 1,00 | 1,90 | 1,90 | 1,90 | 1,90 | 1,90 | — | — | — |
| | $N_{R,k}$ in [kN] | 0,40 | 1,84 | 1,84 | 1,84 | 1,84 | 1,84 | — | — | — |
| | | 0,50 | 2,10 | 2,10 | 2,10 | 3,36 | 3,36 | — | — | — |
| | | 0,55 | 2,10 | 2,10 | 2,10 | 3,36 | 3,36 | — | — | — |
| | | 0,63 | 2,10 | 2,10 | 2,10 | 3,93 | 3,93 | — | — | — |
| | | 0,75 | 2,10 | 2,10 | 2,10 | 3,93 | 3,93 | — | — | — |
| | | 0,88 | 2,10 | 2,10 | 2,10 | 3,93 | 3,93 | — | — | — |
| | | 1,00 | 2,10 | 2,10 | 2,10 | 3,93 | 3,93 | — | — | — |
| max. head displacement u depending on the sandwich panel thickness in [mm] | 30 | 0,7 | 0,7 | 0,7 | 0,7 | 0,7 | — | — | — | |
| | 40 | 0,7 | 0,7 | 0,7 | 0,7 | 0,7 | — | — | — | |
| | 50 | 0,7 | 0,7 | 0,7 | 0,7 | 0,7 | — | — | — | |
| | 60 | 2 | 2 | 2 | 2 | 2 | — | — | — | |
| | 70 | 2 | 2 | 2 | 2 | 2 | — | — | — | |
| | 80 | 2 | 2 | 2 | 2 | 2 | — | — | — | |
| | 90 | 3 | 3 | 3 | 3 | 3 | — | — | — | |
| | 100 | 3 | 3 | 3 | 3 | 3 | — | — | — | |
| | 120 | 3 | 3 | 3 | 3 | 3 | — | — | — | |
| ≥ 140 | 3 | 3 | 3 | 3 | 3 | — | — | — | | |

WKSPW
Fastening screws for sandwich panels

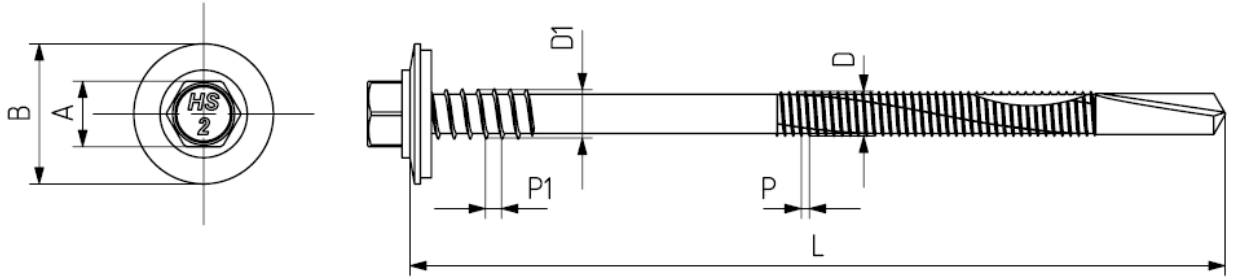
WKSPW (HS2) 5,5/6,3 x L
 with hexagon head and steel sealing washer $\geq \text{Ø}19 \text{ mm}$

Annex 25
 of European
 Technical Assessment
 ETA-13/0421

Materials:
 Fastener: stainless steel – SAE 304, Bi-metal
 Washer: metallic washer made of stainless steel with EPDM sealing ring
 Component I: S280GD, S320GD or S350GD – EN 10346
 Component II: S235 – EN 10025-1, S280GD, S320GD or S350GD – EN 10346

Drilling capacity: $\Sigma(t_{N2} + t_{II}) \leq 12$ mm

Timber substructure
 No performance assessed



| Component II: t_{II} in [mm] | | 4,00 | 5,00 | 6,00 | 8,00 | 10,00 | 11,00 | 14,00 | ≥ 16,00 | |
|--|-------------------|------|------|------|------|-------|-------|-------|---------|---|
| Component I: t_{N1} or t_{N2} in [mm] | $V_{R,k}$ in [kN] | 0,40 | 0,85 | 0,85 | 0,85 | 0,85 | 0,85 | 0,85 | — | — |
| | | 0,50 | 1,40 | 1,40 | 1,40 | 1,40 | 1,40 | 1,40 | — | — |
| | | 0,55 | 1,40 | 1,40 | 1,40 | 1,40 | 1,40 | 1,40 | — | — |
| | | 0,63 | 1,70 | 1,70 | 1,70 | 1,70 | 1,70 | 1,70 | — | — |
| | | 0,75 | 1,98 | 1,98 | 1,98 | 1,98 | 1,98 | 1,98 | — | — |
| | | 0,88 | 1,98 | 1,98 | 1,98 | 1,98 | 1,98 | 1,98 | — | — |
| | | 1,00 | 1,98 | 1,98 | 1,98 | 1,98 | 1,98 | 1,98 | — | — |
| | $N_{R,k}$ in [kN] | 0,40 | 1,65 | 1,65 | 1,65 | 1,65 | 1,65 | 1,65 | — | — |
| | | 0,50 | 2,80 | 2,80 | 2,80 | 2,80 | 2,80 | 2,80 | — | — |
| | | 0,55 | 2,80 | 2,80 | 2,80 | 2,80 | 2,80 | 2,80 | — | — |
| | | 0,63 | 3,60 | 3,60 | 3,60 | 3,60 | 3,60 | 3,60 | — | — |
| | | 0,75 | 4,31 | 4,31 | 4,31 | 4,31 | 4,31 | 4,31 | — | — |
| | | 0,88 | 4,31 | 4,31 | 4,31 | 4,31 | 4,31 | 4,31 | — | — |
| | | 1,00 | 4,31 | 4,31 | 4,31 | 4,31 | 4,31 | 4,31 | — | — |
| max. head displacement u depending on the sandwich panel thickness in [mm] | 30 | 0,7 | 0,7 | 0,7 | 0,7 | 0,7 | 0,7 | — | — | |
| | 40 | 0,7 | 0,7 | 0,7 | 0,7 | 0,7 | 0,7 | — | — | |
| | 50 | 0,7 | 0,7 | 0,7 | 0,7 | 0,7 | 0,7 | — | — | |
| | 60 | 2 | 2 | 2 | 2 | 2 | 2 | — | — | |
| | 70 | 2 | 2 | 2 | 2 | 2 | 2 | — | — | |
| | 80 | 2 | 2 | 2 | 2 | 2 | 2 | — | — | |
| | 90 | 3 | 3 | 3 | 3 | 3 | 3 | — | — | |
| | 100 | 3 | 3 | 3 | 3 | 3 | 3 | — | — | |
| | 120 | 3 | 3 | 3 | 3 | 3 | 3 | — | — | |
| | ≥140 | 3 | 3 | 3 | 3 | 3 | 3 | — | — | |

WKSPW
Fastening screws for sandwich panels

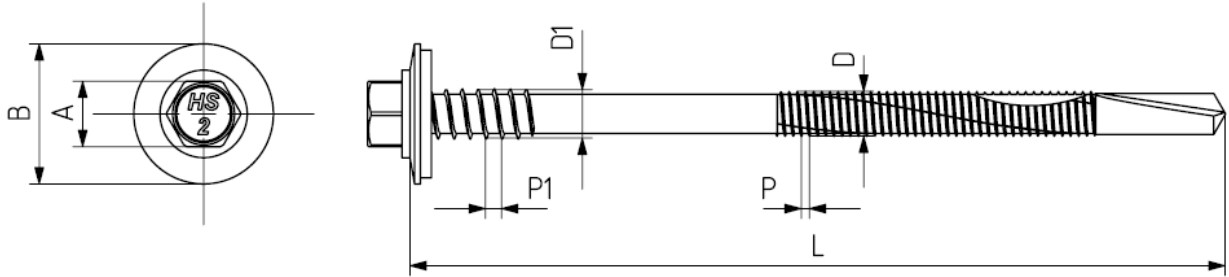
WKSPW (HS2) 5,5/6,3-12 x L
 with hexagon head and steel sealing washer Ø16 mm

Annex 26
 of European
 Technical Assessment
 ETA-13/0421

Materials:
 Fastener: stainless steel – SAE 304, Bi-metal
 Washer: metallic washer made of stainless steel with EPDM sealing ring
 Component I: S280GD, S320GD or S350GD – EN 10346
 Component II: S235 – EN 10025-1, S280GD, S320GD or S350GD – EN 10346

Drilling capacity: $\Sigma(t_{N2} + t_{II}) \leq 12$ mm

Timber substructure
 No performance assessed



| Component II: t_{II} in [mm] | | 4,00 | 5,00 | 6,00 | 8,00 | 10,00 | 11,00 | 14,00 | ≥ 16,00 | |
|--|-------------------|------|------|------|------|-------|-------|-------|---------|---|
| Component I: t_{N1} or t_{N2} in [mm] | $V_{R,k}$ in [kN] | 0,40 | 0,85 | 0,85 | 0,85 | 0,85 | 0,85 | 0,85 | — | — |
| | | 0,50 | 1,40 | 1,40 | 1,40 | 1,40 | 1,40 | 1,40 | — | — |
| | | 0,55 | 1,40 | 1,40 | 1,40 | 1,40 | 1,40 | 1,40 | — | — |
| | | 0,63 | 1,70 | 1,70 | 1,70 | 1,70 | 1,70 | 1,70 | — | — |
| | | 0,75 | 1,98 | 1,98 | 1,98 | 1,98 | 1,98 | 1,98 | — | — |
| | | 0,88 | 1,98 | 1,98 | 1,98 | 1,98 | 1,98 | 1,98 | — | — |
| | | 1,00 | 1,98 | 1,98 | 1,98 | 1,98 | 1,98 | 1,98 | — | — |
| | $N_{R,k}$ in [kN] | 0,40 | 1,84 | 1,84 | 1,84 | 1,84 | 1,84 | 1,84 | — | — |
| | | 0,50 | 3,36 | 3,36 | 3,36 | 3,36 | 3,36 | 3,36 | — | — |
| | | 0,55 | 3,36 | 3,36 | 3,36 | 3,36 | 3,36 | 3,36 | — | — |
| | | 0,63 | 4,12 | 4,12 | 4,12 | 4,12 | 4,12 | 4,12 | — | — |
| | | 0,75 | 5,41 | 5,41 | 5,41 | 5,41 | 5,41 | 5,41 | — | — |
| | | 0,88 | 5,41 | 5,41 | 5,41 | 5,41 | 5,41 | 5,41 | — | — |
| | | 1,00 | 5,41 | 5,41 | 5,41 | 5,41 | 5,41 | 5,41 | — | — |
| max. head displacement u depending on the sandwich panel thickness in [mm] | 30 | 0,7 | 0,7 | 0,7 | 0,7 | 0,7 | 0,7 | — | — | |
| | 40 | 0,7 | 0,7 | 0,7 | 0,7 | 0,7 | 0,7 | — | — | |
| | 50 | 0,7 | 0,7 | 0,7 | 0,7 | 0,7 | 0,7 | — | — | |
| | 60 | 2 | 2 | 2 | 2 | 2 | 2 | — | — | |
| | 70 | 2 | 2 | 2 | 2 | 2 | 2 | — | — | |
| | 80 | 2 | 2 | 2 | 2 | 2 | 2 | — | — | |
| | 90 | 3 | 3 | 3 | 3 | 3 | 3 | — | — | |
| | 100 | 3 | 3 | 3 | 3 | 3 | 3 | — | — | |
| | 120 | 3 | 3 | 3 | 3 | 3 | 3 | — | — | |
| | ≥140 | 3 | 3 | 3 | 3 | 3 | 3 | — | — | |

WKSPW
Fastening screws for sandwich panels

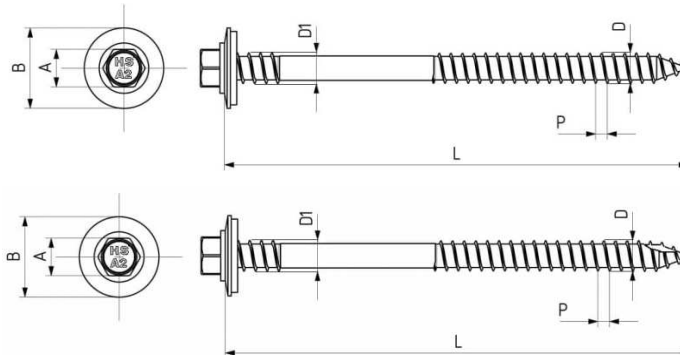
WKSPW (HS2) 5,5/6,3-12 x L
 with hexagon head and steel sealing washer $\geq \varnothing 19$ mm

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Materials:
 Fastener: stainless steel – SAE 304
 Washer: metallic washer made of stainless steel with EPDM sealing ring
 Component I: S280GD, S320GD or S350GD – EN 10346
 Component II: S235 – EN 10025-1, S280GD, S320GD or S350GD – EN 10346
 or structural timber – EN 14081

Drilling capacity: -

Timber substructures
 For timber structures performance assessed with
 $M_{y,Rk} = 7,404 \text{ Nm}$
 $f_{ax,k} = 16,627 \text{ N/mm}^2$ for $l_{ef} \geq 20 \text{ mm}$



| Effective length $l_{ef} \geq 20 \text{ mm}$ | | Component II: wood class $\geq \text{C24}$ | |
|---|------|---|--------------|
| | | Thickness of sandwich panel in the fixing point | |
| | | 20,00 | $\geq 30,00$ |
| $V_{R,k} \text{ [kN]}$ for $t_{N,2} \text{ [mm]}$ | 0,40 | 0,82 | 0,82 |
| | 0,50 | 1,48 | 1,48 |
| | 0,55 | 1,48 | 1,48 |
| | 0,63 | 1,65 | 1,65 |
| | 0,75 | 1,90 | 1,90 |
| | 0,88 | 1,90 | 1,90 |
| | 1,00 | 1,90 | 1,90 |
| $N_{R,k} \text{ [kN]}$ for $t_{N,1} \text{ [mm]}$ | 0,40 | 1,65 | 1,65 |
| | 0,50 | 2,16 | 2,80 |
| | 0,55 | 2,16 | 2,80 |
| | 0,63 | 2,16 | 3,43 |
| | 0,75 | 2,16 | 3,43 |
| | 0,88 | 2,16 | 3,43 |
| | 1,00 | 2,16 | 3,43 |
| max. head displacement u depending on sandwich panel thickness [mm] | | 1 | 1 |

WKSPW
Fastening screws for sandwich panels

WKSPW (HSA2) 6,5 x L
 with hexagon head and stainless steel sealing washer $\varnothing 16 \text{ mm}$

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Materials:

- Fastener: stainless steel – SAE 304
- Washer: metallic washer made of stainless steel with EPDM sealing ring
- Component I: S280GD, S320GD or S350GD – EN 10346
- Component II: S235 – EN 10025-1, S280GD, S320GD or S350GD – EN 10346 or structural timber – EN 14081

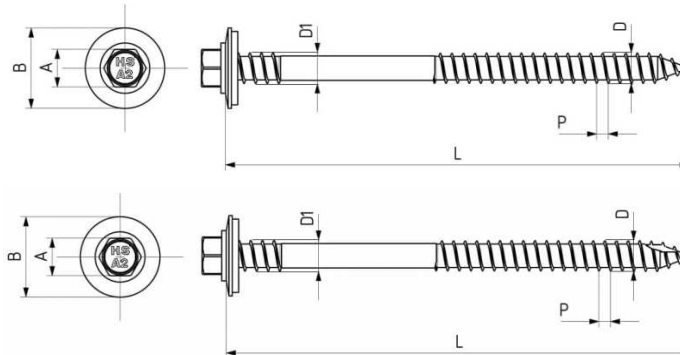
Drilling capacity: -

Timber substructures

For timber structures performance assessed with

$$M_{y,Rk} = 7,404 \text{ Nm}$$

$$f_{ax,k} = 16,627 \text{ N/mm}^2 \text{ for } l_{ef} \geq 20 \text{ mm}$$



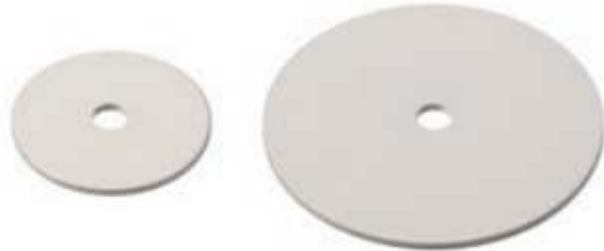
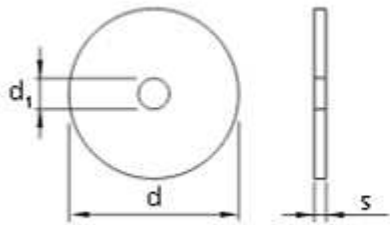
| Effective length $l_{ef} \geq 20 \text{ mm}$ | | Component II: wood class $\geq \text{C24}$ | |
|---|--|---|--------------|
| | | Thickness of sandwich panel in the fixing point | |
| | | 20,00 | $\geq 30,00$ |
| $V_{R,k} \text{ [kN] for } t_{N,2} \text{ [mm]}$ | 0,40 | 0,82 | 0,82 |
| | 0,50 | 1,48 | 1,48 |
| | 0,55 | 1,48 | 1,48 |
| | 0,63 | 1,65 | 1,65 |
| | 0,75 | 1,90 | 1,90 |
| | 0,88 | 1,90 | 1,90 |
| | 1,00 | 1,90 | 1,90 |
| | $N_{R,k} \text{ [kN] for } t_{N,1} \text{ [mm]}$ | 0,40 | 1,84 |
| 0,50 | | 2,16 | 3,36 |
| 0,55 | | 2,16 | 3,36 |
| 0,63 | | 2,16 | 3,43 |
| 0,75 | | 2,16 | 3,43 |
| 0,88 | | 2,16 | 3,43 |
| 1,00 | | 2,16 | 3,43 |
| max. head displacement u depending on sandwich panel thickness [mm] | | 1 | 1 |

WKSPW
Fastening screws for sandwich panels

WKSPW (HSA2) 6,5 x L
with hexagon head and stainless steel sealing washer $\geq \text{Ø}19 \text{ mm}$

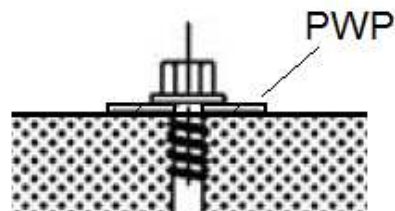
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Steel washer PWP



| | d | d ₁ | s |
|------------|----|----------------|-----|
| PWP-409010 | 40 | 7,4 | 2,0 |
| PWP-709010 | 70 | 7,4 | 2,0 |

PWP is made of carbon steel $R_m \geq 250$ MPa and galvanized min. 140 g/m² with powder coating or stainless steel 1,4301 acc. to EN 10088 with powder coating



WKSPW
Fastening screws for sandwich panels

Steel washer PWP

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Determination of design values

1. Determination of Design Shear Resistance

The determination of the design values of the shear resistance depends on the type of substructure.

For Metal Supporting Substructures the following applies:

The design values $V_{R,d}$ of the shear resistance are the characteristic values of the shear resistance divided by the recommended partial safety factor $\gamma_M = 1,33$. The recommended partial safety factor γ_M should be used in cases where no value is given in national regulations of the Member State where the fastening screws are used.

For Timber Supporting Substructures the following applies:

The design values $V_{R,d}$ of the shear resistance are the characteristic values of the shear resistance multiplied by k_{mod} according to EN 1995-1-1 Section 8.7 (Screwed connections), Table 3.1, and divided by the recommended partial safety factor $\gamma_M = 1,33$. If failure of the inner face with the thickness t_{N2} and not failure of the timber substructure is the relevant failure mode then $k_{mod} = 1.0$.

The recommended partial safety factor γ_M should be used in cases where no value is given in national regulations of the Member State where the fastening screws are used.

2. Determination of Design Pull-through, Pull-out and Tension Resistance

The design values of the pull-through resistance are the characteristic values of the pull-through resistance divided by the recommended partial safety factor $\gamma_M = 1,33$. The recommended partial safety factor γ_M should be used in cases where no value is given in national regulations of the Member State where the fastening screws are used.

The determination of the design values of the pull-out resistance depends on the type of substructure.

For Metal Supporting Substructures the following applies:

The design values of the pull-out resistance are the characteristic values of the pull-out resistance divided by the recommended partial safety factor $\gamma_M = 1,33$. The recommended partial safety factor γ_M should be used in cases where no value is given in national regulations of the Member State where the fastening screws are used.

For Timber Supporting Substructures the following applies:

The design values of the pull-out resistance are the characteristic values of the pull-out resistance multiplied by k_{mod} according to EN 1995-1-1 Section 8.7 (Screwed connections), Table 3.1, and divided by the recommended partial safety factor $\gamma_M = 1,33$. The recommended partial safety factor γ_M should be used in cases where no value is given in national regulations of the Member State where the fastening screws are used.

The design tension resistance $N_{R,d}$ is the minimum value of the design values of either pull-through resistance or relevant pull-out resistance for the corresponding connection.

3. Design Resistance in case of combined Tension and Shear Forces (interaction)

In case of combined tension and shear forces the linear interaction formula according to EN 1993-1-3, section 8.3 (8) should be taken into account.

| | |
|---|---|
| WKSPW Fastening screws for sandwich panels | Annex 31 of European Technical Assessment ETA-13/0421 |
| Determination of design values | |