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European Technical Assessment

ETA-16/0444 of 30/06/2016

General part

Technical Assessment Body issuing the European Technical Assessment	Instytut Techniki Budowlanej
Trade name of the construction product	WSW, WSWx, WSWOC, A2-WSW WB6P, WB6P-D, A2-WB6P
Product family to which the construction product belongs	Fastening screws for sandwich panels
Manufacturer	KLIMAS Sp. z o.o. ul. Wincentego Witosa 135/137 42-233 Mykanów Poland
Manufacturing plant	WKRĘT-MET sp. z o.o., sp. komandytowa ul. Wincentego Witosa 170/176 42-233 Mykanów Poland
This European Technical Assessment contains	27 pages including 22 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”

Specific part

1. Technical description of the product

The fastening screws for sandwich panels WSW, WSWx, WSWOC, A2-WSW, WB6P, WB6P-D and A2-WB6P are a self-drilling and self-tapping screws listed in Table 1. Screws are completed with a steel or aluminum washer and an EPDM sealing ring. For details see the Annexes 2 to 21.

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

Table 1

No.	Screw	Material	Annex
1	WSWOC-6-5,5 × L	galvanized carbon steel with ≥ 12 µm of zinc	2, 3, 4, 5
2	WSWx-6-5,5 × L	galvanized carbon steel with ≥ 20 µm of zinc	2, 3, 4, 5
3	WSW-6-5,5 × L	galvanized carbon steel with ceramic coating	2, 3, 4, 5
4	A2-WSW-6-5,5 × L	stainless steel (bi-metal)	10, 11, 12, 13
5	WSWOC-12-5,5 × L	galvanized carbon steel with ≥ 12 µm of zinc	6, 7, 8, 9
6	WSWx-12-5,5 × L	galvanized carbon steel with ≥ 20 µm of zinc	6, 7, 8, 9
7	WSW-12-5,5 × L	galvanized carbon steel with ceramic coating	6, 7, 8, 9
8	A2-WSW-12-5,5 × L	stainless steel (bi-metal)	14, 15, 16, 17
9	WB6P-6,3 × L	galvanized carbon steel with ≥ 12 µm of zinc	18, 19
10	WB6Px-6,3 × L	galvanized carbon steel with ≥ 20 µm of zinc	18, 19
11	WB6P-D-6,3 × L	galvanized carbon steel with ceramic coating	18, 19
12	A2-WB6P-6,3 × L	stainless steel (bi-metal)	20, 21

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 21. 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 for sandwich panels and connections for indoor and outdoor applications. Fastening screws which are intended to be used in external environments with ≥ 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 21. The values were determined by tests according to EAD 330047-01-0602.

The design values shall be determined according to Annex 22 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. Fastening screw which are made of stainless steel are intended to be used in external environments ≥ C2 corrosion according to the standard EN ISO 12944-2.

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 clauses contained in this European Technical Assessment, 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

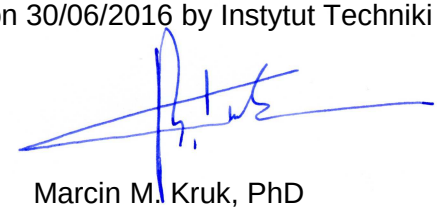
According to Decision 1998/214/EC, amended by 2001/596/EC, of the European Commission the system 2+ of assessment and verification of constancy of performance applies (see Annex V to Regulation (EU) No 305/2011).

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.

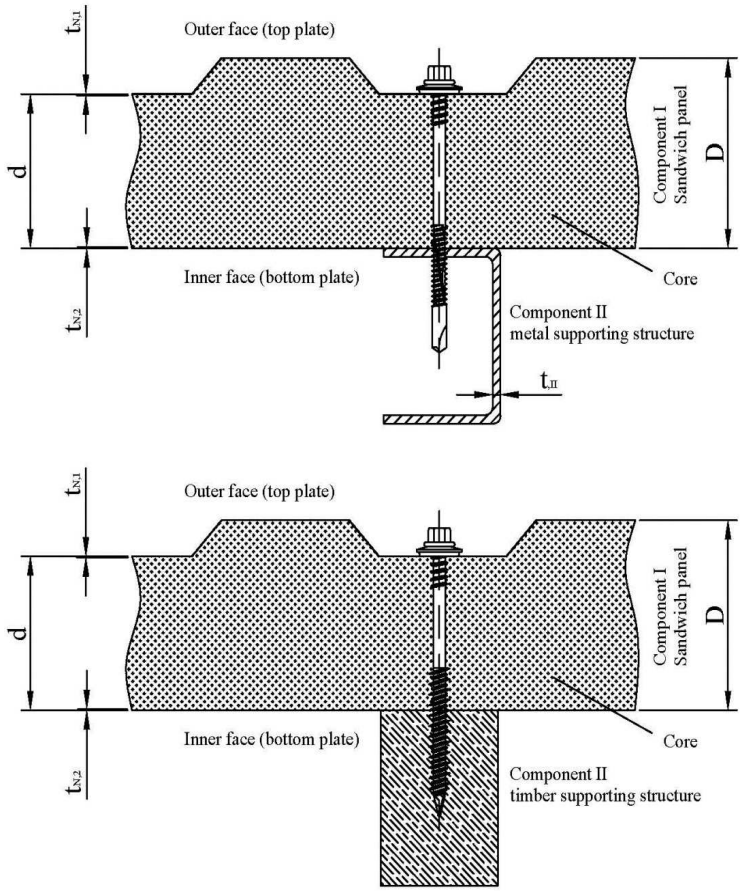
Issued in Warsaw on 30/06/2016 by Instytut Techniki Budowlanej



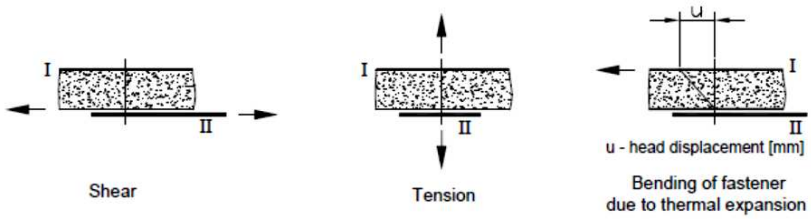
Marcin M. Kruk, PhD

Director of ITB

Examples of execution of a connections



Loading conditions



WSW, WSWx, WSWOC, A2-WSW, WB6P, WB6P-D, A2-WB6P **Fastening screws for sandwich panels**	**Annex 1** of European Technical Assessment ETA-16/0444
Example of execution of a connections. Loading conditions	

Materials

Fastener: carbon steel – SAE1022
quenched, tempered and galvanized
or galvanized and additionally protected by ceramic coating

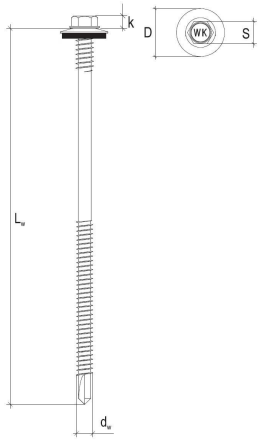
Washer: EPDM sealing ring with metal top
made of coated carbon steel or stainless steel

Component I: S280GD, S320GD or S350GD – EN 10346

Component II: t_{II} < 4 mm: S235 – EN 10025-1
t_{II} ≥ 4 mm: S280GD, S320GD or S350GD – EN 10346

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

Timber substructures
no performance assessed



L_w = 50-300 mm
d_w = 5,5 mm
D = 16 mm

Component II: t_{II} [mm]			2,00	2,50	3,00	4,00	5,00
Component I: $t_{N,1}$ or $t_{N,2}$ [mm]	$V_{R,k}$ [kN]	**0,40**	0,83	0,83	0,83	0,83	0,83
		0,50	1,31	1,31	1,31	1,31	1,31
		0,55	1,31	1,31	1,31	1,31	1,31
		0,63	1,63	1,63	1,63	1,63	1,63
		0,75	1,93	1,93	1,93	1,93	1,93
		0,88	1,93	1,93	1,93	1,93	1,93
		1,00	1,93	1,93	1,93	1,93	1,93
	$N_{R,k}$ [kN]	**0,40**	1,64	1,64	1,64	1,64	1,64
		0,50	2,37	2,37	2,37	3,02	3,02
		0,55	2,37	2,37	2,37	3,02	3,02
		0,63	2,37	2,37	2,37	3,91	3,91
		0,75	2,37	2,37	2,37	4,17	4,17
		0,88	2,37	2,37	2,37	4,17	4,17
		1,00	2,37	2,37	2,37	4,17	4,17
max. head displacement u depending on the sandwich panel thickness [mm]		**30**	12	12	12	1,5	1,5
		40	12	12	12	1,5	1,5
		50	12	12	12	1,5	1,5
		60	18	18	18	4	4
		70	18	18	18	4	4
		80	18	18	18	4	4
		90	23	23	23	10	10
		100	23	23	23	10	10
		120	23	23	23	10	10
		>140	23	23	23	10	10

WSW, WSWx, WSWOC, A2-WSW, WB6P, WB6P-D, A2-WB6P
Fastening screws for sandwich panels

WSWOC-6-5,5 x L, WSWx-6-5,5 x L and WSW-6-5,5 x L
Self-drilling screws with hexagon head and sealing washer ≥ Ø16 mm
with metal top made of coated carbon steel (Z) or stainless steel (S)

Annex 2

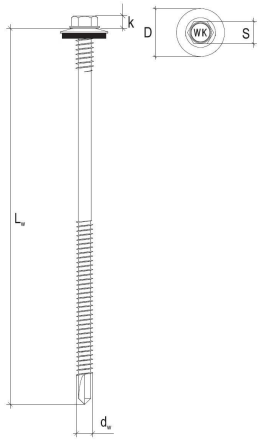
of European Technical Assessment ETA-16/0444

Materials

Fastener:	carbon steel – SAE1022 quenched, tempered and galvanized or galvanized and additionally protected by ceramic coating
Washer:	EPDM sealing ring with metal top made of aluminum
Component I:	S280GD, S320GD or S350GD – EN 10346
Component II:	t_{II} < 4 mm: S235 – EN 10025-1 t_{II} ≥ 4 mm: S280GD, S320GD or S350GD – EN 10346

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

Timber substructures
no performance assessed



L_w = 50-300 mm
d_w = 5,5 mm
D = 16 mm

Component II: t_{II} [mm]			2,00	2,50	3,00	4,00	5,00
Component I: $t_{N,1}$ or $t_{N,2}$ [mm]	$V_{R,k}$ [kN]	**0,40**	0,83	0,83	0,83	0,83	0,83
		0,50	1,31	1,31	1,31	1,31	1,31
		0,55	1,31	1,31	1,31	1,31	1,31
		0,63	1,63	1,63	1,63	1,63	1,63
		0,75	1,93	1,93	1,93	1,93	1,93
		0,88	1,93	1,93	1,93	1,93	1,93
		1,00	1,93	1,93	1,93	1,93	1,93
	$N_{R,k}$ [kN]	**0,40**	1,64	1,64	1,64	1,64	1,64
		0,50	2,37	2,37	2,37	2,98	2,98
		0,55	2,37	2,37	2,37	2,98	2,98
		0,63	2,37	2,37	2,37	3,80	3,80
		0,75	2,37	2,37	2,37	3,99	3,99
		0,88	2,37	2,37	2,37	3,99	3,99
		1,00	2,37	2,37	2,37	3,99	3,99
max. head displacement u depending on the sandwich panel thickness [mm]		**30**	12	12	12	1,5	1,5
		40	12	12	12	1,5	1,5
		50	12	12	12	1,5	1,5
		60	18	18	18	4	4
		70	18	18	18	4	4
		80	18	18	18	4	4
		90	23	23	23	10	10
		100	23	23	23	10	10
		120	23	23	23	10	10
		>140	23	23	23	10	10

WSW, WSWx, WSWOC, A2-WSW, WB6P, WB6P-D, A2-WB6P
Fastening screws for sandwich panels

Annex 3
of European Technical Assessment ETA-16/0444

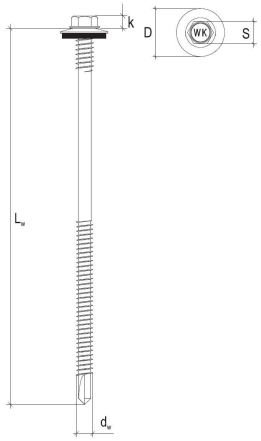
WSWOC-6-5,5 x L, WSWx-6-5,5 x L and WSW-6-5,5 x L
Self-drilling screws with hexagon head and sealing washer ≥ Ø16 mm with metal top made of aluminum (A)

Materials

Fastener:	carbon steel – SAE1022 quenched, tempered and galvanized or galvanized and additionally protected by ceramic coating
Washer:	EPDM sealing ring with metal top made of coated carbon steel or stainless steel
Component I:	S280GD, S320GD or S350GD – EN 10346
Component II:	t_{II} < 4 mm: S235 – EN 10025-1 t_{II} ≥ 4 mm: S280GD, S320GD or S350GD – EN 10346

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

Timber substructures
no performance assessed



L_w = 50-300 mm
d_w = 5,5 mm
D ≥ 19 mm

Component II: t_{II} [mm]			2,00	2,50	3,00	4,00	5,00
Component I: $t_{N,1}$ or $t_{N,2}$ [mm]	$V_{R,k}$ [kN]	**0,40**	0,83	0,83	0,83	0,83	0,83
		0,50	1,31	1,31	1,31	1,31	1,31
		0,55	1,31	1,31	1,31	1,31	1,31
		0,63	1,63	1,63	1,63	1,63	1,63
		0,75	1,93	1,93	1,93	1,93	1,93
		0,88	1,93	1,93	1,93	1,93	1,93
		1,00	1,93	1,93	1,93	1,93	1,93
	$N_{R,k}$ [kN]	**0,40**	1,83	1,83	1,83	1,83	1,83
		0,50	2,37	2,37	2,37	3,14	3,14
		0,55	2,37	2,37	2,37	3,14	3,14
		0,63	2,37	2,37	2,37	4,21	4,21
		0,75	2,37	2,37	2,37	4,62	4,62
		0,88	2,37	2,37	2,37	4,62	4,62
		1,00	2,37	2,37	2,37	4,62	4,62
max. head displacement u depending on the sandwich panel thickness [mm]		**30**	12	12	12	1,5	1,5
		40	12	12	12	1,5	1,5
		50	12	12	12	1,5	1,5
		60	18	18	18	4	4
		70	18	18	18	4	4
		80	18	18	18	4	4
		90	23	23	23	10	10
		100	23	23	23	10	10
		120	23	23	23	10	10
		>140	23	23	23	10	10

WSW, WSWx, WSWOC, A2-WSW, WB6P, WB6P-D, A2-WB6P
Fastening screws for sandwich panels

Annex 4
of European Technical Assessment ETA-16/0444

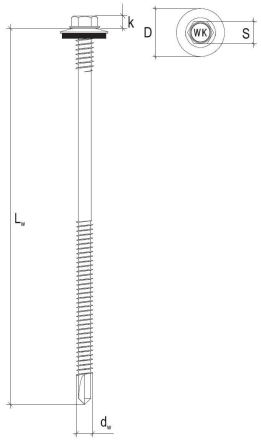
WSWOC-6-5,5 x L, WSWx-6-5,5 x L and WSW-6-5,5 x L
Self-drilling screws with hexagon head and sealing washer ≥ Ø19 mm
with metal top made of coated carbon steel (Z) or stainless steel (S)

Materials

Fastener:	carbon steel – SAE1022 quenched, tempered and galvanized or galvanized and additionally protected by ceramic coating
Washer:	EPDM sealing ring with metal top made of aluminum
Component I:	S280GD, S320GD or S350GD – EN 10346
Component II:	t_{II} < 4 mm: S235 – EN 10025-1 t_{II} ≥ 4 mm: S280GD, S320GD or S350GD – EN 10346

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

Timber substructures
no performance assessed



L_w = 50-300 mm
d_w = 5,5 mm
D ≥ 19 mm

Component II: t_{II} [mm]			2,00	2,50	3,00	4,00	5,00
Component I: $t_{N,1}$ or $t_{N,2}$ [mm]	$V_{R,k}$ [kN]	**0,40**	0,83	0,83	0,83	0,83	0,83
		0,50	1,31	1,31	1,31	1,31	1,31
		0,55	1,31	1,31	1,31	1,31	1,31
		0,63	1,63	1,63	1,63	1,63	1,63
		0,75	1,93	1,93	1,93	1,93	1,93
		0,88	1,93	1,93	1,93	1,93	1,93
		1,00	1,93	1,93	1,93	1,93	1,93
	$N_{R,k}$ [kN]	**0,40**	1,83	1,83	1,83	1,83	1,83
		0,50	2,37	2,37	2,37	3,17	3,17
		0,55	2,37	2,37	2,37	3,17	3,17
		0,63	2,37	2,37	2,37	4,04	4,04
		0,75	2,37	2,37	2,37	4,64	4,64
		0,88	2,37	2,37	2,37	4,64	4,64
		1,00	2,37	2,37	2,37	4,64	4,64
max. head displacement u depending on the sandwich panel thickness [mm]		**30**	12	12	12	1,5	1,5
		40	12	12	12	1,5	1,5
		50	12	12	12	1,5	1,5
		60	18	18	18	4	4
		70	18	18	18	4	4
		80	18	18	18	4	4
		90	23	23	23	10	10
		100	23	23	23	10	10
		120	23	23	23	10	10
		>140	23	23	23	10	10

WSW, WSWx, WSWOC, A2-WSW, WB6P, WB6P-D, A2-WB6P
Fastening screws for sandwich panels

Annex 5
of European Technical Assessment ETA-16/0444

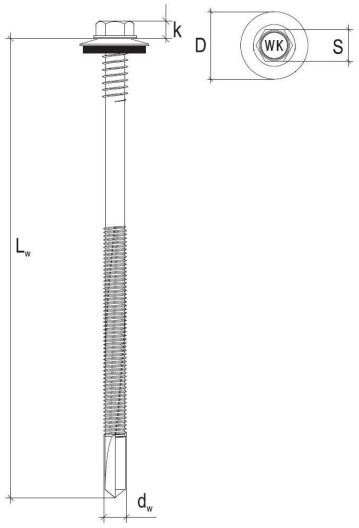
WSWOC-6-5,5 x L, WSWx-6-5,5 x L and WSW-6-5,5 x L
Self-drilling screws with hexagon head and sealing washer ≥ Ø19 mm with metal top made of aluminum (A)

Materials

Fastener:	carbon steel – SAE1022 quenched, tempered and galvanized or galvanized and additionally protected by ceramic coating
Washer:	EPDM sealing ring with metal top made of coated carbon steel or stainless steel
Component I:	S280GD, S320GD or S350GD – EN 10346
Component II:	S280GD, S320GD or S350GD – EN 10346

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

Timber substructures
no performance assessed



L_w = 50-300 mm
d_w = 5,5 mm
D = 16 mm

Component II: t_{II} [mm]			4,00	5,00	6,00	8,00	10,00	11,00
Component I: $t_{N,1}$ or $t_{N,2}$ [mm]	$V_{R,k}$ [kN]	**0,40**	0,83	0,83	0,83	0,83	0,83	0,83
		0,50	1,33	1,33	1,33	1,33	1,33	1,33
		0,55	1,33	1,33	1,33	1,33	1,33	1,33
		0,63	1,62	1,62	1,62	1,62	1,62	1,62
		0,75	1,91	1,91	1,91	1,91	1,91	1,91
		0,88	1,91	1,91	1,91	1,91	1,91	1,91
		1,00	1,91	1,91	1,91	1,91	1,91	1,91
	$N_{R,k}$ [kN]	**0,40**	1,64	1,64	1,64	1,64	1,64	1,64
		0,50	3,02	3,02	3,02	3,02	3,02	3,02
		0,55	3,02	3,02	3,02	3,02	3,02	3,02
		0,63	3,91	3,91	3,91	3,91	3,91	3,91
		0,75	4,17	4,17	4,17	4,17	4,17	4,17
		0,88	4,17	4,17	4,17	4,17	4,17	4,17
		1,00	4,17	4,17	4,17	4,17	4,17	4,17
max. head displacement u depending on the sandwich panel thickness [mm]		**30**	1,5	1,5	1,5	1,5	1,5	1,5
		40	1,5	1,5	1,5	1,5	1,5	1,5
		50	1,5	1,5	1,5	1,5	1,5	1,5
		60	4	4	4	4	4	4
		70	4	4	4	4	4	4
		80	4	4	4	4	4	4
		90	6	6	6	6	6	6
		100	6	6	6	6	6	6
		120	6	6	6	6	6	6
		>140	6	6	6	6	6	6

WSW, WSWx, WSWOC, A2-WSW, WB6P, WB6P-D, A2-WB6P
Fastening screws for sandwich panels

WSWOC-12-5,5 x L, WSWx-12-5,5 x L and WSW-12-5,5 x L
Self-drilling screws with hexagon head and sealing washer ≥ Ø16 mm
with metal top made of coated carbon steel (Z) or stainless steel (S)

Annex 6

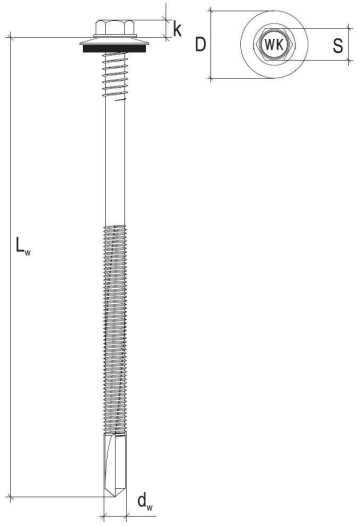
of European Technical Assessment ETA-16/0444

Materials

Fastener:	carbon steel – SAE1022 quenched, tempered and galvanized or galvanized and additionally protected by ceramic coating
Washer:	EPDM sealing ring with metal top made of aluminum
Component I:	S280GD, S320GD or S350GD – EN 10346
Component II:	S280GD, S320GD or S350GD – EN 10346

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

Timber substructures
no performance assessed



L_w = 50-300 mm
d_w = 5,5 mm
D= 16 mm

Component II: t_{II} [mm]			4,00	5,00	6,00	8,00	10,00	11,00
Component I: $t_{N,1}$ or $t_{N,2}$ [mm]	$V_{R,k}$ [kN]	**0,40**	0,83	0,83	0,83	0,83	0,83	0,83
		0,50	1,33	1,33	1,33	1,33	1,33	1,33
		0,55	1,33	1,33	1,33	1,33	1,33	1,33
		0,63	1,62	1,62	1,62	1,62	1,62	1,62
		0,75	1,91	1,91	1,91	1,91	1,91	1,91
		0,88	1,91	1,91	1,91	1,91	1,91	1,91
		1,00	1,91	1,91	1,91	1,91	1,91	1,91
	$N_{R,k}$ [kN]	**0,40**	1,64	1,64	1,64	1,64	1,64	1,64
		0,50	2,98	2,98	2,98	2,98	2,98	2,98
		0,55	2,98	2,98	2,98	2,98	2,98	2,98
		0,63	3,80	3,80	3,80	3,80	3,80	3,80
		0,75	3,99	3,99	3,99	3,99	3,99	3,99
		0,88	3,99	3,99	3,99	3,99	3,99	3,99
		1,00	3,99	3,99	3,99	3,99	3,99	3,99
max. head displacement u depending on the sandwich panel thickness [mm]		**30**	1,5	1,5	1,5	1,5	1,5	1,5
		40	1,5	1,5	1,5	1,5	1,5	1,5
		50	1,5	1,5	1,5	1,5	1,5	1,5
		60	4	4	4	4	4	4
		70	4	4	4	4	4	4
		80	4	4	4	4	4	4
		90	6	6	6	6	6	6
		100	6	6	6	6	6	6
		120	6	6	6	6	6	6
		>140	6	6	6	6	6	6

WSW, WSWx, WSWOC, A2-WSW, WB6P, WB6P-D, A2-WB6P
Fastening screws for sandwich panels

WSWOC-12-5,5 x L, WSWx-12-5,5 x L and WSW-12-5,5 x L
Self-drilling screws with hexagon head and sealing washer ≥ Ø16 mm
with metal top made of aluminum (A)

Annex 7

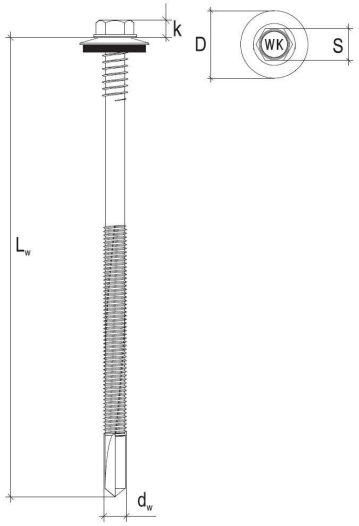
of European Technical Assessment ETA-16/0444

Materials

Fastener:	carbon steel – SAE1022 quenched, tempered and galvanized or galvanized and additionally protected by ceramic coating
Washer:	EPDM sealing ring with metal top made of coated carbon steel or stainless steel
Component I:	S280GD, S320GD or S350GD – EN 10346
Component II:	S280GD, S320GD or S350GD – EN 10346

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

Timber substructures
no performance assessed



L_w = 50-300 mm
d_w = 5,5 mm
D ≥ 19 mm

Component II: t_{II} [mm]			4,00	5,00	6,00	8,00	10,00	11,00
Component I: $t_{N,1}$ or $t_{N,2}$ [mm]	$V_{R,k}$ [kN]	**0,40**	0,83	0,83	0,83	0,83	0,83	0,83
		0,50	1,33	1,33	1,33	1,33	1,33	1,33
		0,55	1,33	1,33	1,33	1,33	1,33	1,33
		0,63	1,62	1,62	1,62	1,62	1,62	1,62
		0,75	1,91	1,91	1,91	1,91	1,91	1,91
		0,88	1,91	1,91	1,91	1,91	1,91	1,91
		1,00	1,91	1,91	1,91	1,91	1,91	1,91
	$N_{R,k}$ [kN]	**0,40**	1,83	1,83	1,83	1,83	1,83	1,83
		0,50	3,14	3,14	3,14	3,14	3,14	3,14
		0,55	3,14	3,14	3,14	3,14	3,14	3,14
		0,63	4,21	4,21	4,21	4,21	4,21	4,21
		0,75	4,62	4,62	4,62	4,62	4,62	4,62
		0,88	4,62	4,62	4,62	4,62	4,62	4,62
		1,00	4,62	4,62	4,62	4,62	4,62	4,62
max. head displacement u depending on the sandwich panel thickness [mm]		**30**	1,5	1,5	1,5	1,5	1,5	1,5
		40	1,5	1,5	1,5	1,5	1,5	1,5
		50	1,5	1,5	1,5	1,5	1,5	1,5
		60	4	4	4	4	4	4
		70	4	4	4	4	4	4
		80	4	4	4	4	4	4
		90	6	6	6	6	6	6
		100	6	6	6	6	6	6
		120	6	6	6	6	6	6
		>140	6	6	6	6	6	6

WSW, WSWx, WSWOC, A2-WSW, WB6P, WB6P-D, A2-WB6P
Fastening screws for sandwich panels

WSWOC-12-5,5 x L, WSWx-12-5,5 x L and WSW-12-5,5 x L
Self-drilling screws with hexagon head and sealing washer ≥ Ø19 mm
with metal top made of coated carbon steel (Z) or stainless steel (S)

Annex 8

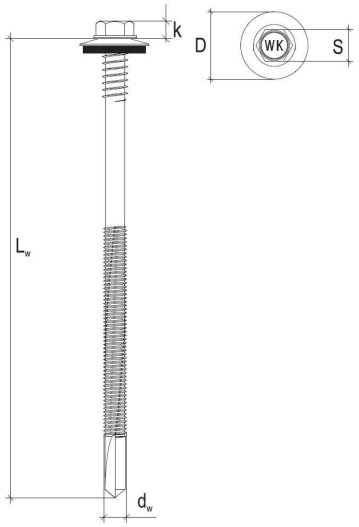
of European Technical Assessment ETA-16/0444

Materials

Fastener:	carbon steel – SAE1022 quenched, tempered and galvanized or galvanized and additionally protected by ceramic coating
Washer:	EPDM sealing ring with metal top made of aluminum
Component I:	S280GD, S320GD or S350GD – EN 10346
Component II:	S280GD, S320GD or S350GD – EN 10346

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

Timber substructures
no performance assessed



L_w = 50-300 mm
d_w = 5,5 mm
D ≥ 19 mm

Component II: t_{II} [mm]			4,00	5,00	6,00	8,00	10,00	11,00
Component I: $t_{N,1}$ or $t_{N,2}$ [mm]	$V_{R,k}$ [kN]	**0,40**	0,83	0,83	0,83	0,83	0,83	0,83
		0,50	1,33	1,33	1,33	1,33	1,33	1,33
		0,55	1,33	1,33	1,33	1,33	1,33	1,33
		0,63	1,62	1,62	1,62	1,62	1,62	1,62
		0,75	1,91	1,91	1,91	1,91	1,91	1,91
		0,88	1,91	1,91	1,91	1,91	1,91	1,91
		1,00	1,91	1,91	1,91	1,91	1,91	1,91
	$N_{R,k}$ [kN]	**0,40**	1,83	1,83	1,83	1,83	1,83	1,83
		0,50	3,17	3,17	3,17	3,17	3,17	3,17
		0,55	3,17	3,17	3,17	3,17	3,17	3,17
		0,63	4,04	4,04	4,04	4,04	4,04	4,04
		0,75	4,64	4,64	4,64	4,64	4,64	4,64
		0,88	4,64	4,64	4,64	4,64	4,64	4,64
		1,00	4,64	4,64	4,64	4,64	4,64	4,64
max. head displacement u depending on the sandwich panel thickness [mm]		**30**	1,5	1,5	1,5	1,5	1,5	1,5
		40	1,5	1,5	1,5	1,5	1,5	1,5
		50	1,5	1,5	1,5	1,5	1,5	1,5
		60	4	4	4	4	4	4
		70	4	4	4	4	4	4
		80	4	4	4	4	4	4
		90	6	6	6	6	6	6
		100	6	6	6	6	6	6
		120	6	6	6	6	6	6
		>140	6	6	6	6	6	6

WSW, WSWx, WSWOC, A2-WSW, WB6P, WB6P-D, A2-WB6P
Fastening screws for sandwich panels

WSWOC-12-5,5 x L, WSWx-12-5,5 x L and WSW-12-5,5 x L
Self-drilling screws with hexagon head and sealing washer ≥ Ø19 mm
with metal top made of aluminum (A)

Annex 9

of European Technical Assessment ETA-16/0444

Materials
Fastener: stainless steel – SAE304, bi-metal

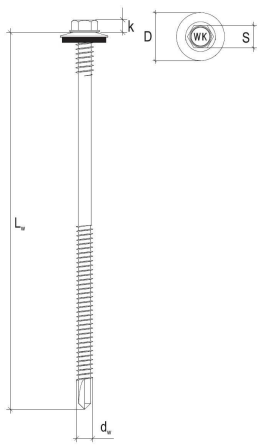
Washer: EPDM sealing ring with metal top made of stainless steel

Component I: S280GD, S320GD or S350GD – EN 10346

Component II: t_{II} < 4 mm: S235 – EN 10025-1
t_{II} ≥ 4 mm: S280GD, S320GD or S350GD – EN 10346

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

Timber substructures
no performance assessed



L_w = 50-300 mm
d_w = 5,5 mm
D = 16 mm

Component II: t_{II} [mm]			**2,00**	**2,50**	**3,00**	**4,00**	**5,00**
Component I: $t_{N,1}$ or $t_{N,2}$ [mm]	**$V_{R,k}$ [kN]**	**0,40**	0,83	0,83	0,83	0,83	0,83
		0,50	1,31	1,31	1,31	1,31	1,31
		0,55	1,31	1,31	1,31	1,31	1,31
		0,63	1,63	1,63	1,63	1,63	1,63
		0,75	1,93	1,93	1,93	1,93	1,93
		0,88	1,93	1,93	1,93	1,93	1,93
		1,00	1,93	1,93	1,93	1,93	1,93
	$N_{R,k}$ [kN]	**0,40**	1,64	1,64	1,64	1,64	1,64
		0,50	2,36	2,36	2,36	3,02	3,02
		0,55	2,36	2,36	2,36	3,02	3,02
		0,63	2,36	2,36	2,36	3,91	3,91
		0,75	2,36	2,36	2,36	4,17	4,17
		0,88	2,36	2,36	2,36	4,17	4,17
		1,00	2,36	2,36	2,36	4,17	4,17
max. head displacement u depending on the sandwich panel thickness [mm]		**30**	12	12	12	1,5	1,5
		40	12	12	12	1,5	1,5
		50	12	12	12	1,5	1,5
		60	18	18	18	4	4
		70	18	18	18	4	4
		80	18	18	18	4	4
		90	23	23	23	10	10
		100	23	23	23	10	10
		120	23	23	23	10	10
		>140	23	23	23	10	10

WSW, WSWx, WSWOC, A2-WSW, WB6P, WB6P-D, A2-WB6P
Fastening screws for sandwich panels

Annex 10
of European Technical Assessment ETA-16/0444

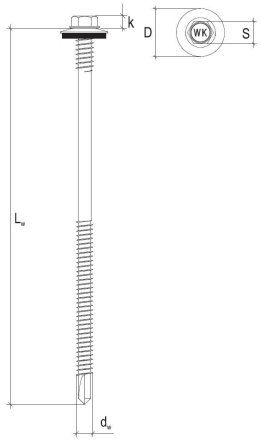
A2-WSW-6-5,5 x L
Self-drilling screws with hexagon head and sealing washer ≥ Ø16 mm with metal top made of stainless steel (S)

Materials

Fastener:	stainless steel – SAE304, bi-metal
Washer:	EPDM sealing ring with metal top made of aluminum
Component I:	S280GD, S320GD or S350GD – EN 10346
Component II:	t_{II} < 4 mm: S235 – EN 10025-1 t_{II} ≥ 4 mm: S280GD, S320GD or S350GD – EN 10346

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

Timber substructures
no performance assessed



L_w = 50-300 mm
d_w = 5,5 mm
D = 16 mm

Component II: t_{II} [mm]			2,00	2,50	3,00	4,00	5,00
Component I: $t_{N,1}$ or $t_{N,2}$ [mm]	$V_{R,k}$ [kN]	**0,40**	0,83	0,83	0,83	0,83	0,83
		0,50	1,31	1,31	1,31	1,31	1,31
		0,55	1,31	1,31	1,31	1,31	1,31
		0,63	1,63	1,63	1,63	1,63	1,63
		0,75	1,93	1,93	1,93	1,93	1,93
		0,88	1,93	1,93	1,93	1,93	1,93
		1,00	1,93	1,93	1,93	1,93	1,93
	$N_{R,k}$ [kN]	**0,40**	1,64	1,64	1,64	1,64	1,64
		0,50	2,36	2,36	2,36	2,98	2,98
		0,55	2,36	2,36	2,36	2,98	2,98
		0,63	2,36	2,36	2,36	3,80	3,80
		0,75	2,36	2,36	2,36	3,99	3,99
		0,88	2,36	2,36	2,36	3,99	3,99
		1,00	2,36	2,36	2,36	3,99	3,99
max. head displacement u depending on the sandwich panel thickness [mm]		**30**	12	12	12	1,5	1,5
		40	12	12	12	1,5	1,5
		50	12	12	12	1,5	1,5
		60	18	18	18	4	4
		70	18	18	18	4	4
		80	18	18	18	4	4
		90	23	23	23	10	10
		100	23	23	23	10	10
		120	23	23	23	10	10
		>140	23	23	23	10	10

WSW, WSWx, WSWOC, A2-WSW, WB6P, WB6P-D, A2-WB6P
Fastening screws for sandwich panels

Annex 11
of European Technical Assessment ETA-16/0444

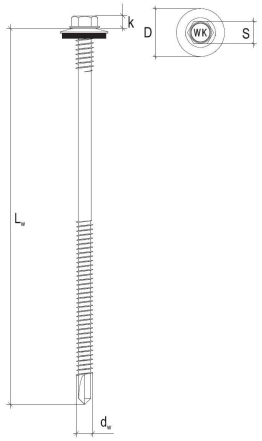
A2-WSW-6-5,5 x L
Self-drilling screws with hexagon head and sealing washer ≥ Ø16 mm with metal top made of aluminum (A)

Materials

Fastener:	stainless steel – SAE304, bi-metal
Washer:	EPDM sealing ring with metal top made of stainless steel
Component I:	S280GD, S320GD or S350GD – EN 10346
Component II:	t_{II} < 4 mm: S235 – EN 10025-1 t_{II} ≥ 4 mm: S280GD, S320GD or S350GD – EN 10346

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

Timber substructures
no performance assessed



L_w = 50-300 mm
d_w = 5,5 mm
D = ≥ 19 mm

Component II: t_{II} [mm]			2,00	2,50	3,00	4,00	5,00
Component I: $t_{N,1}$ or $t_{N,2}$ [mm]	$V_{R,k}$ [kN]	**0,40**	0,83	0,83	0,83	0,83	0,83
		0,50	1,31	1,31	1,31	1,31	1,31
		0,55	1,31	1,31	1,31	1,31	1,31
		0,63	1,63	1,63	1,63	1,63	1,63
		0,75	1,93	1,93	1,93	1,93	1,93
		0,88	1,93	1,93	1,93	1,93	1,93
		1,00	1,93	1,93	1,93	1,93	1,93
	$N_{R,k}$ [kN]	**0,40**	1,83	1,83	1,83	1,83	1,83
		0,50	2,36	2,36	2,36	3,14	3,14
		0,55	2,36	2,36	2,36	3,14	3,14
		0,63	2,36	2,36	2,36	4,21	4,21
		0,75	2,36	2,36	2,36	4,62	4,62
		0,88	2,36	2,36	2,36	4,62	4,62
		1,00	2,36	2,36	2,36	4,62	4,62
max. head displacement u depending on the sandwich panel thickness [mm]		**30**	12	12	12	1,5	1,5
		40	12	12	12	1,5	1,5
		50	12	12	12	1,5	1,5
		60	18	18	18	4	4
		70	18	18	18	4	4
		80	18	18	18	4	4
		90	23	23	23	10	10
		100	23	23	23	10	10
		120	23	23	23	10	10
		>140	23	23	23	10	10

WSW, WSWx, WSWOC, A2-WSW, WB6P, WB6P-D, A2-WB6P
Fastening screws for sandwich panels

Annex 12
of European Technical Assessment ETA-16/0444

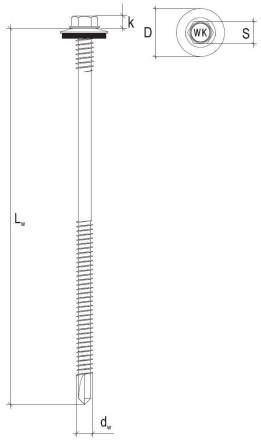
A2-WSW-6-5,5 x L
Self-drilling screws with hexagon head and sealing washer ≥ Ø19 mm with metal top made of stainless steel (S)

Materials

Fastener:	stainless steel – SAE304, bi-metal
Washer:	EPDM sealing ring with metal top made of aluminum
Component I:	S280GD, S320GD or S350GD – EN 10346
Component II:	t_{II} < 4 mm: S235 – EN 10025-1 t_{II} ≥ 4 mm: S280GD, S320GD or S350GD – EN 10346

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

Timber substructures
no performance assessed



L_w = 50-300 mm
d_w = 5,5 mm
D ≥ 19 mm

Component II: t_{II} [mm]			2,00	2,50	3,00	4,00	5,00
Component I: $t_{N,1}$ or $t_{N,2}$ [mm]	$V_{R,k}$ [kN]	**0,40**	0,83	0,83	0,83	0,83	0,83
		0,50	1,31	1,31	1,31	1,31	1,31
		0,55	1,31	1,31	1,31	1,31	1,31
		0,63	1,63	1,63	1,63	1,63	1,63
		0,75	1,93	1,93	1,93	1,93	1,93
		0,88	1,93	1,93	1,93	1,93	1,93
		1,00	1,93	1,93	1,93	1,93	1,93
	$N_{R,k}$ [kN]	**0,40**	1,83	1,83	1,83	1,83	1,83
		0,50	2,36	2,36	2,36	3,17	3,17
		0,55	2,36	2,36	2,36	3,17	3,17
		0,63	2,36	2,36	2,36	4,04	4,04
		0,75	2,36	2,36	2,36	4,64	4,64
		0,88	2,36	2,36	2,36	4,64	4,64
		1,00	2,36	2,36	2,36	4,64	4,64
max. head displacement u depending on the sandwich panel thickness [mm]		**30**	12	12	12	1,5	1,5
		40	12	12	12	1,5	1,5
		50	12	12	12	1,5	1,5
		60	18	18	18	4	4
		70	18	18	18	4	4
		80	18	18	18	4	4
		90	23	23	23	10	10
		100	23	23	23	10	10
		120	23	23	23	10	10
		>140	23	23	23	10	10

WSW, WSWx, WSWOC, A2-WSW, WB6P, WB6P-D, A2-WB6P
Fastening screws for sandwich panels

Annex 13
of European Technical Assessment ETA-16/0444

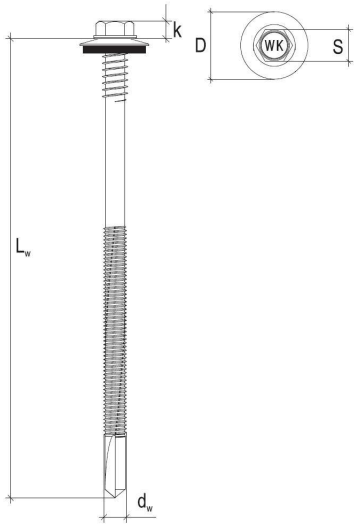
A2-WSW-6-5,5 x L
Self-drilling screws with hexagon head and sealing washer ≥ Ø19 mm with metal top made of aluminum (A)

Materials

Fastener:	stainless steel – SAE304, bi-metal
Washer:	EPDM sealing ring with metal top made of stainless steel
Component I:	S280GD, S320GD or S350GD – EN 10346
Component II:	S280GD, S320GD or S350GD – EN 10346

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

Timber substructures
no performance assessed



L_w = 50-300 mm
d_w = 5,5 mm
D = 16 mm

Component II: t_{II} [mm]			4,00	5,00	6,00	8,00	10,00	11,00
Component I: $t_{N,1}$ or $t_{N,2}$ [mm]	$V_{R,k}$ [kN]	**0,40**	0,83	0,83	0,83	0,83	0,83	0,83
		0,50	1,33	1,33	1,33	1,33	1,33	1,33
		0,55	1,33	1,33	1,33	1,33	1,33	1,33
		0,63	1,62	1,62	1,62	1,62	1,62	1,62
		0,75	1,91	1,91	1,91	1,91	1,91	1,91
		0,88	1,91	1,91	1,91	1,91	1,91	1,91
		1,00	1,91	1,91	1,91	1,91	1,91	1,91
	$N_{R,k}$ [kN]	**0,40**	1,64	1,64	1,64	1,64	1,64	1,64
		0,50	3,02	3,02	3,02	3,02	3,02	3,02
		0,55	3,02	3,02	3,02	3,02	3,02	3,02
		0,63	3,91	3,91	3,91	3,91	3,91	3,91
		0,75	4,17	4,17	4,17	4,17	4,17	4,17
		0,88	4,17	4,17	4,17	4,17	4,17	4,17
		1,00	4,17	4,17	4,17	4,17	4,17	4,17
max. head displacement u depending on the sandwich panel thickness [mm]		**30**	1,5	1,5	1,5	1,5	1,5	1,5
		40	1,5	1,5	1,5	1,5	1,5	1,5
		50	1,5	1,5	1,5	1,5	1,5	1,5
		60	4	4	4	4	4	4
		70	4	4	4	4	4	4
		80	4	4	4	4	4	4
		90	6	6	6	6	6	6
		100	6	6	6	6	6	6
		120	6	6	6	6	6	6
		>140	6	6	6	6	6	6

WSW, WSWx, WSWOC, A2-WSW, WB6P, WB6P-D, A2-WB6P
Fastening screws for sandwich panels

A2-WSW-12-5,5 x L
Self-drilling screws with hexagon head and sealing washer ≥ Ø16 mm with metal top made of stainless steel (S)

Annex 14

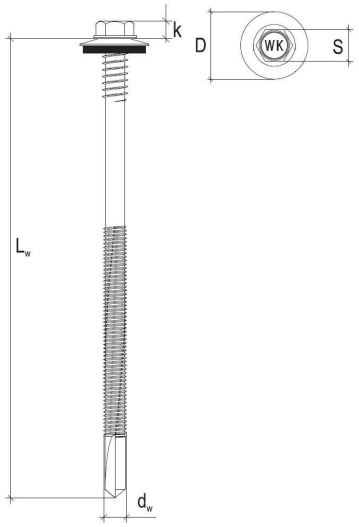
of European Technical Assessment ETA-16/0444

Materials

Fastener:	stainless steel – SAE304, bi-metal
Washer:	EPDM sealing ring with metal top made of aluminum
Component I:	S280GD, S320GD or S350GD – EN 10346
Component II:	S280GD, S320GD or S350GD – EN 10346

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

Timber substructures
no performance assessed



L_w = 50-300 mm
d_w = 5,5 mm
D = 16 mm

Component II: t_{II} [mm]			4,00	5,00	6,00	8,00	10,00	11,00
Component I: $t_{N,1}$ or $t_{N,2}$ [mm]	$V_{R,k}$ [kN]	**0,40**	0,83	0,83	0,83	0,83	0,83	0,83
		0,50	1,33	1,33	1,33	1,33	1,33	1,33
		0,55	1,33	1,33	1,33	1,33	1,33	1,33
		0,63	1,62	1,62	1,62	1,62	1,62	1,62
		0,75	1,91	1,91	1,91	1,91	1,91	1,91
		0,88	1,91	1,91	1,91	1,91	1,91	1,91
		1,00	1,91	1,91	1,91	1,91	1,91	1,91
	$N_{R,k}$ [kN]	**0,40**	1,64	1,64	1,64	1,64	1,64	1,64
		0,50	2,98	2,98	2,98	2,98	2,98	2,98
		0,55	2,98	2,98	2,98	2,98	2,98	2,98
		0,63	3,80	3,80	3,80	3,80	3,80	3,80
		0,75	3,99	3,99	3,99	3,99	3,99	3,99
		0,88	3,99	3,99	3,99	3,99	3,99	3,99
		1,00	3,99	3,99	3,99	3,99	3,99	3,99
max. head displacement u depending on the sandwich panel thickness [mm]		**30**	1,5	1,5	1,5	1,5	1,5	1,5
		40	1,5	1,5	1,5	1,5	1,5	1,5
		50	1,5	1,5	1,5	1,5	1,5	1,5
		60	4	4	4	4	4	4
		70	4	4	4	4	4	4
		80	4	4	4	4	4	4
		90	6	6	6	6	6	6
		100	6	6	6	6	6	6
		120	6	6	6	6	6	6
		>140	6	6	6	6	6	6

WSW, WSWx, WSWOC, A2-WSW, WB6P, WB6P-D, A2-WB6P
Fastening screws for sandwich panels

A2-WSW-12-5,5 x L
Self-drilling screws with hexagon head and sealing washer ≥ Ø16 mm with metal top made of aluminum (A)

Annex 15

of European Technical Assessment ETA-16/0444

Materials
Fastener: stainless steel – SAE304, bi-metal

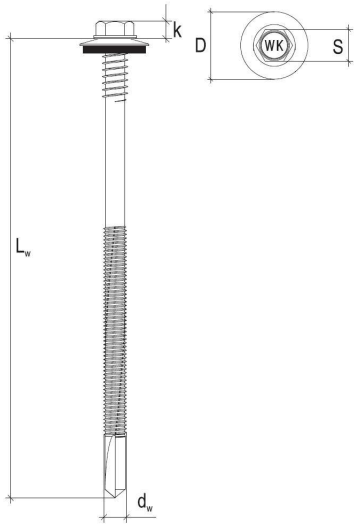
Washer: EPDM sealing ring with metal top made of stainless steel

Component I: S280GD, S320GD or S350GD – EN 10346

Component II: S280GD, S320GD or S350GD – EN 10346

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

Timber substructures
no performance assessed



L_w = 50-300 mm
d_w = 5,5 mm
D ≥ 19 mm

Component II: t_{II} [mm]			4,00	5,00	6,00	8,00	10,00	11,00
Component I: $t_{N,1}$ or $t_{N,2}$ [mm]	$V_{R,k}$ [kN]	**0,40**	0,83	0,83	0,83	0,83	0,83	0,83
		0,50	1,33	1,33	1,33	1,33	1,33	1,33
		0,55	1,33	1,33	1,33	1,33	1,33	1,33
		0,63	1,62	1,62	1,62	1,62	1,62	1,62
		0,75	1,91	1,91	1,91	1,91	1,91	1,91
		0,88	1,91	1,91	1,91	1,91	1,91	1,91
		1,00	1,91	1,91	1,91	1,91	1,91	1,91
	$N_{R,k}$ [kN]	**0,40**	1,83	1,83	1,83	1,83	1,83	1,83
		0,50	3,14	3,14	3,14	3,14	3,14	3,14
		0,55	3,14	3,14	3,14	3,14	3,14	3,14
		0,63	4,21	4,21	4,21	4,21	4,21	4,21
		0,75	4,62	4,62	4,62	4,62	4,62	4,62
		0,88	4,62	4,62	4,62	4,62	4,62	4,62
		1,00	4,62	4,62	4,62	4,62	4,62	4,62
max. head displacement u depending on the sandwich panel thickness [mm]		**30**	1,5	1,5	1,5	1,5	1,5	1,5
		40	1,5	1,5	1,5	1,5	1,5	1,5
		50	1,5	1,5	1,5	1,5	1,5	1,5
		60	4	4	4	4	4	4
		70	4	4	4	4	4	4
		80	4	4	4	4	4	4
		90	6	6	6	6	6	6
		100	6	6	6	6	6	6
		120	6	6	6	6	6	6
		>140	6	6	6	6	6	6

WSW, WSWx, WSWOC, A2-WSW, WB6P, WB6P-D, A2-WB6P
Fastening screws for sandwich panels

Annex 16
of European Technical Assessment ETA-16/0444

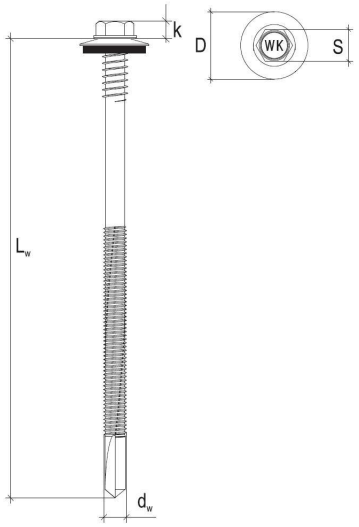
A2-WSW-12-5,5 x L
Self-drilling screws with hexagon head and sealing washer ≥ Ø19 mm with metal top made of stainless steel (S)

Materials

Fastener:	stainless steel – SAE304, bi-metal
Washer:	EPDM sealing ring with metal top made of aluminum
Component I:	S280GD, S320GD or S350GD – EN 10346
Component II:	S280GD, S320GD or S350GD – EN 10346

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

Timber substructures
no performance assessed



L_w = 50-300 mm
d_w = 5,5 mm
D ≥ 19 mm

Component II: t_{II} [mm]			4,00	5,00	6,00	8,00	10,00	11,00
Component I: $t_{N,1}$ or $t_{N,2}$ [mm]	$V_{R,k}$ [kN]	**0,40**	0,83	0,83	0,83	0,83	0,83	0,83
		0,50	1,33	1,33	1,33	1,33	1,33	1,33
		0,55	1,33	1,33	1,33	1,33	1,33	1,33
		0,63	1,62	1,62	1,62	1,62	1,62	1,62
		0,75	1,91	1,91	1,91	1,91	1,91	1,91
		0,88	1,91	1,91	1,91	1,91	1,91	1,91
		1,00	1,91	1,91	1,91	1,91	1,91	1,91
	$N_{R,k}$ [kN]	**0,40**	1,83	1,83	1,83	1,83	1,83	1,83
		0,50	3,17	3,17	3,17	3,17	3,17	3,17
		0,55	3,17	3,17	3,17	3,17	3,17	3,17
		0,63	4,04	4,04	4,04	4,04	4,04	4,04
		0,75	4,64	4,64	4,64	4,64	4,64	4,64
		0,88	4,64	4,64	4,64	4,64	4,64	4,64
		1,00	4,64	4,64	4,64	4,64	4,64	4,64
max. head displacement u depending on the sandwich panel thickness in [mm]		**30**	1,5	1,5	1,5	1,5	1,5	1,5
		40	1,5	1,5	1,5	1,5	1,5	1,5
		50	1,5	1,5	1,5	1,5	1,5	1,5
		60	4	4	4	4	4	4
		70	4	4	4	4	4	4
		80	4	4	4	4	4	4
		90	6	6	6	6	6	6
		100	6	6	6	6	6	6
		120	6	6	6	6	6	6
		>140	6	6	6	6	6	6

WSW, WSWx, WSWOC, A2-WSW, WB6P, WB6P-D, A2-WB6P
Fastening screws for sandwich panels

Annex 17
of European Technical Assessment ETA-16/0444

A2-WSW-12-5,5 x L
Self-drilling screws with hexagon head and sealing washer ≥ Ø19 mm with metal top made of aluminum (A)

Materials

Fastener: carbon steel – SAE1022
quenched, tempered and galvanized (≥ 12 µm)

Washer: EPDM sealing ring with metal top
made of coated carbon steel or stainless steel

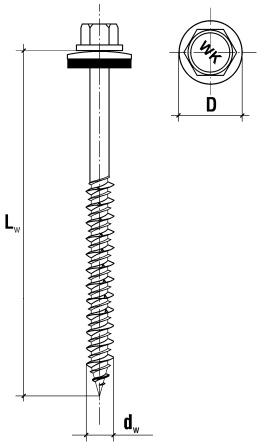
Component I: S280GD, S320GD or S350GD – EN 10346

Component II: structural timber – EN 14081

Drilling capacity: —

Timber substructures

For timber substructures performance assessed with
$M_{y,Rk}$ = 8,910 Nm
$f_{ax,k}$ = 16,586 N/mm^2 for l_{ef} ≥ 30 mm



L_w = 30-300 mm
d_w = 6,3 mm
D ≥ 19 mm

Component II: wood class ≥ C24			Effective lenght l_{ef} [mm]							
			≥ 30,00	–	–	–	–	–	–	–
Component I: $t_{N,1}$ lub $t_{N,2}$ [mm]	**$V_{R,k}$ [kN]**	**0,40**	0,87	–	–	–	–	–	–	–
		0,50	1,35	–	–	–	–	–	–	–
		0,55	1,35	–	–	–	–	–	–	–
		0,63	1,70	–	–	–	–	–	–	–
		0,75	2,10	–	–	–	–	–	–	–
		0,88	2,10	–	–	–	–	–	–	–
		1,00	2,10	–	–	–	–	–	–	–
	$N_{R,k}$ [kN]	**0,40**	1,83	–	–	–	–	–	–	–
		0,50	3,13	–	–	–	–	–	–	–
		0,55	3,13	–	–	–	–	–	–	–
		0,63	3,13	–	–	–	–	–	–	–
		0,75	3,13	–	–	–	–	–	–	–
		0,88	3,13	–	–	–	–	–	–	–
		1,00	3,13	–	–	–	–	–	–	–
max. head displacement u depending on the sandwich panel thickness [mm]		**30**	1	–	–	–	–	–	–	–
		40	1	–	–	–	–	–	–	–
		50	1	–	–	–	–	–	–	–
		60	1,5	–	–	–	–	–	–	–
		70	1,5	–	–	–	–	–	–	–
		80	1,5	–	–	–	–	–	–	–
		90	2	–	–	–	–	–	–	–
		100	2	–	–	–	–	–	–	–
		120	2	–	–	–	–	–	–	–
		≥ 140	2	–	–	–	–	–	–	–

WSW, WSWx, WSWOC, A2-WSW, WB6P, WB6P-D, A2-WB6P
Fastening screws for sandwich panels

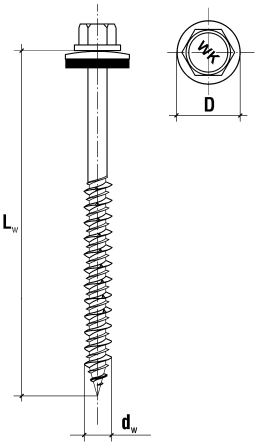
WB6P-6,3 x L, WB6Px-6,3 x L, WB6P-D-6,3 x L
Self-tapping screws with hexagon head and sealing washer ≥ Ø19 mm
with metal top made of coated carbon steel (Z) or stainless steel (S)

Annex 18

of European Technical Assessment ETA-16/0444

Materials

Fastener:	carbon steel – SAE1022 quenched, tempered and galvanized (≥ 12 µm)
Washer:	EPDM sealing ring with metal top made of aluminum
Component I:	S280GD, S320GD or S350GD – EN 10346
Component II:	structural timber – EN 14081



L_w = 30-300 mm
d_w = 6,3 mm
D ≥ 19 mm

Drilling capacity: —

Timber substructures
For timber substructures performance assessed with
$M_{y,Rk}$ = 8,910 Nm
$f_{ax,k}$ = 16,586 N/mm^2 for l_{ef} ≥ 30 mm

Component II: wood class ≥ C24			**Effective lenght l_{ef} [mm]**							
			≥ 30,00	–	–	–	–	–	–	–
Component I: $t_{N,1}$ lub $t_{N,2}$ [mm]	**$V_{R,k}$ [kN]**	**0,40**	0,87	–	–	–	–	–	–	–
		0,50	1,35	–	–	–	–	–	–	–
		0,55	1,35	–	–	–	–	–	–	–
		0,63	1,70	–	–	–	–	–	–	–
		0,75	2,10	–	–	–	–	–	–	–
		0,88	2,10	–	–	–	–	–	–	–
		1,00	2,10	–	–	–	–	–	–	–
	$N_{R,k}$ [kN]	**0,40**	1,83	–	–	–	–	–	–	–
		0,50	3,13	–	–	–	–	–	–	–
		0,55	3,13	–	–	–	–	–	–	–
		0,63	3,13	–	–	–	–	–	–	–
		0,75	3,13	–	–	–	–	–	–	–
		0,88	3,13	–	–	–	–	–	–	–
		1,00	3,13	–	–	–	–	–	–	–
max. head displacement u depending on the sandwich panel thickness [mm]		**30**	1	–	–	–	–	–	–	–
		40	1	–	–	–	–	–	–	–
		50	1	–	–	–	–	–	–	–
		60	1,5	–	–	–	–	–	–	–
		70	1,5	–	–	–	–	–	–	–
		80	1,5	–	–	–	–	–	–	–
		90	2	–	–	–	–	–	–	–
		100	2	–	–	–	–	–	–	–
		120	2	–	–	–	–	–	–	–
		≥ 140	2	–	–	–	–	–	–	–

WSW, WSWx, WSWOC, A2-WSW, WB6P, WB6P-D, A2-WB6P
Fastening screws for sandwich panels

WB6P-6,3 x L, WB6Px-6,3 x L, WB6P-D-6,3 x L
Self-tapping screws with hexagon head and sealing washer ≥ Ø19 mm with metal top made of aluminum (A)

Annex 19

of European Technical Assessment ETA-16/0444

Materials

Fastener:	stainless steel – SAE304
Washer:	EPDM sealing ring with metal top made of stainless steel
Component I:	S280GD, S320GD or S350GD – EN 10346
Component II:	structural timber – EN 14081

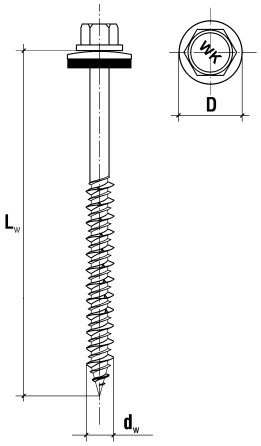
Drilling capacity: —

Timber substructures

For timber substructures performance assessed with

$M_{y,Rk}$ = 6,830 Nm

$f_{ax,k}$ = 16,586 N/mm^2 for l_{ef} ≥ 30 mm



L_w = 30-300 mm
d_w = 6,3 mm
D ≥ 19 mm

Component II: wood class ≥ C24			Effective lenght l_{ef} [mm]							
			≥ 30,00	–	–	–	–	–	–	–
Component I: $t_{N,1}$ lub $t_{N,2}$ [mm]	**$V_{R,k}$ [kN]**	**0,40**	0,87	–	–	–	–	–	–	–
		0,50	1,35	–	–	–	–	–	–	–
		0,55	1,35	–	–	–	–	–	–	–
		0,63	1,70	–	–	–	–	–	–	–
		0,75	2,10	–	–	–	–	–	–	–
		0,88	2,10	–	–	–	–	–	–	–
		1,00	2,10	–	–	–	–	–	–	–
	$N_{R,k}$ [kN]	**0,40**	1,83	–	–	–	–	–	–	–
		0,50	3,13	–	–	–	–	–	–	–
		0,55	3,13	–	–	–	–	–	–	–
		0,63	3,13	–	–	–	–	–	–	–
		0,75	3,13	–	–	–	–	–	–	–
		0,88	3,13	–	–	–	–	–	–	–
		1,00	3,13	–	–	–	–	–	–	–
max. head displacement u depending on the sandwich panel thickness [mm]		**30**	1	–	–	–	–	–	–	–
		40	1	–	–	–	–	–	–	–
		50	1	–	–	–	–	–	–	–
		60	1,5	–	–	–	–	–	–	–
		70	1,5	–	–	–	–	–	–	–
		80	1,5	–	–	–	–	–	–	–
		90	2	–	–	–	–	–	–	–
		100	2	–	–	–	–	–	–	–
		120	2	–	–	–	–	–	–	–
		≥ 140	2	–	–	–	–	–	–	–

WSW, WSWx, WSWOC, A2-WSW, WB6P, WB6P-D, A2-WB6P
Fastening screws for sandwich panels

Annex 20

of European Technical Assessment ETA-16/0444

A2-WB6P-6,3 x L
Self-tapping screws with hexagon head and sealing washer ≥ Ø19 mm with metal top made of stainless steel (S)

Materials

Fastener:	stainless steel – SAE304
Washer:	EPDM sealing ring with metal top made of aluminum
Component I:	S280GD, S320GD or S350GD – EN 10346
Component II:	structural timber – EN 14081

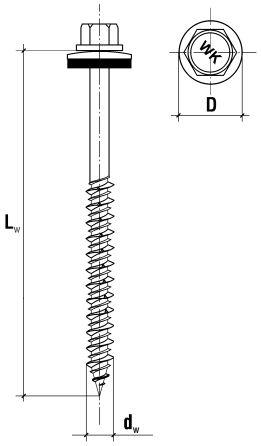
Drilling capacity: —

Timber substructures

For timber substructures performance assessed with

$M_{y,Rk}$ = 6,830 Nm

$f_{ax,k}$ = 16,586 N/mm^2 for $l_{ef} \geq 30$ mm



L_w = 30-300 mm
d_w = 6,3 mm
D ≥ 19 mm

Component II: wood class ≥ C24			Effective lenght l_{ef} [mm]							
			≥ 30,00	–	–	–	–	–	–	–
Component I: $t_{N,1}$ lub $t_{N,2}$ [mm]	**$V_{R,k}$ [kN]**	**0,40**	0,87	–	–	–	–	–	–	–
		0,50	1,35	–	–	–	–	–	–	–
		0,55	1,35	–	–	–	–	–	–	–
		0,63	1,70	–	–	–	–	–	–	–
		0,75	2,10	–	–	–	–	–	–	–
		0,88	2,10	–	–	–	–	–	–	–
		1,00	2,10	–	–	–	–	–	–	–
	$N_{R,k}$ [kN]	**0,40**	1,83	–	–	–	–	–	–	–
		0,50	3,13	–	–	–	–	–	–	–
		0,55	3,13	–	–	–	–	–	–	–
		0,63	3,13	–	–	–	–	–	–	–
		0,75	3,13	–	–	–	–	–	–	–
		0,88	3,13	–	–	–	–	–	–	–
		1,00	3,13	–	–	–	–	–	–	–
max. head displacement u depending on the sandwich panel thickness [mm]		**30**	1	–	–	–	–	–	–	–
		40	1	–	–	–	–	–	–	–
		50	1	–	–	–	–	–	–	–
		60	1,5	–	–	–	–	–	–	–
		70	1,5	–	–	–	–	–	–	–
		80	1,5	–	–	–	–	–	–	–
		90	2	–	–	–	–	–	–	–
		100	2	–	–	–	–	–	–	–
		120	2	–	–	–	–	–	–	–
		≥ 140	2	–	–	–	–	–	–	–

WSW, WSWx, WSWOC, A2-WSW, WB6P, WB6P-D, A2-WB6P
Fastening screws for sandwich panels

Annex 21

of European Technical Assessment ETA-16/0444

A2-WB6P-6,3 x L
Self-tapping screws with hexagon head and sealing washer ≥ Ø19 mm with metal top made of aluminum (A)

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 γ_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 γ_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 γ_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 γ_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 γ_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) or EN 1999-1-4, section 8.1 (7) should be taken into account.

WFD, WDD, WSB, WSBP, WS, WF, WSS, WB6 **Fastening screws for metal members and sheeting**	**Annex 22** of European Technical Assessment ETA-16/0444
Determination of Design Values	