INSTYTUT TECHNIKI BUDOWLANEJ

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European Technical Assessment

ETA-24/0064 of 15/05/2024

General Part

Technical Assessment Body issuing the European Technical Assessment	Instytut Techniki Budowlanej
Trade name of the construction product	SWPS-3, SWPS-5, SWPS-7 and SWPS-C
Product family to which the construction product belongs	Fastening screws for sandwich panels
Manufacturer	pgb-Polska Sp. z o.o. ul. Fryderyka Wilhelma Redena 3 PL 41-807 Zabrze Poland
Manufacturing plant	Plant 11
This European Technical Assessment contains	20 pages including 16 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) 330047-01-0602 “Fastening screws for sandwich panels”

This European Technical Assessment is issued by the Technical Assessment Body in its official language. Translations of this European Technical Assessment in other languages shall fully correspond to the original issued document and shall be identified as such.

Specific Part

1 Technical description of the product

The fastening screws for sandwich panels SWPS-3, SWPS-5, SWPS-7 and SWPS-C, are a self-drilling and self-tapping screws listed in Table 1. Screws are completed with an aluminum or carbon steel washer with EPDM seal. For details see the Annexes 3 to 14. All screws can be completed with additional saddle washer or washer (Annexes 15 and 16).

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

Table 1

No.	Screw	Material	Annex
1	SWPS-3 5,5/6,3 x L	carbon steel zinc plated with Premium coating	3, 4, 5
2	SWPS-5 5,5/6,3 x L	carbon steel zinc plated with Premium coating	6, 7, 8
3	SWPS-7 5,5/6,3 x L	carbon steel zinc plated with Premium coating	9, 10, 11
4	SWPS-C 6,4/7,0 x L	carbon steel zinc plated with Premium coating	12, 13, 14

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. 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 C1 application, according to EN ISO 12944-2.

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

Example of execution of 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 Performance of the product and references to the methods used for its 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 Annexes 3 to 14. The values were determined by tests according to EAD 330047-01-0602.

The design values shall be determined according to Annex 2 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.

3.2 Methods used for the assessment

The assessment 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 in the applicable European Assessment Document (EAD)

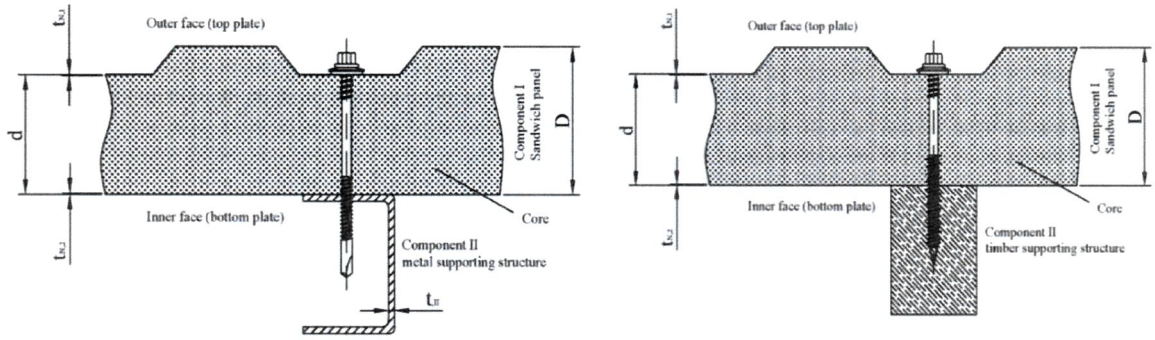
Technical details necessary for the implementation of the AVCP system are laid down in the control plan deposited in Instytut Techniki Budowlanej.

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 15/05/2024 by Instytut Techniki Budowlanej

Anna Panek, MSc
Deputy Director of ITB

Examples of execution of a connections



Description of the components

Component I Sandwich panel with outer and inner skin made of steel

Component II Substructure made of steel or timber

Dimensions of the components

t_I	Thickness of sandwich panel
t_{N1}	Thickness of sandwich panel outer skin
t_{N2}	Thickness of the inner skin of component I
t_{II}	Thickness of component II made of steel
l_{ef}	Effective screw-in length in timber substructure (without drill point or without thread point)
l_p	Screw-in length in timber substructure (including drill point or including thread point)
d_{dp}	Pre-drill diameter for component I and II

Performance characteristics

$N_{R,k}$	Characteristic value of tension resistance of the connection
$V_{R,k}$	Characteristic value of shear resistance of the connection
u	Bending capacity of the fastening screw (maximum displacement of the upper end of the screw)
$N_{R,I,k}$	Characteristic value of pull-through resistance through the sandwich panel (component I)
$N_{R,II,k}$	Characteristic value of pull-out resistance out of the substructure (component II)
$M_{y,Rk}$	Characteristic value of yield moment of the fastening screw (timber structure)
$f_{ax,k}$	Characteristic value of withdrawal strength (timber structure)

SWPS-3, SWPS-5, SWPS-7, SWPS-C **Fastening screws for sandwich panels**	**Annex 1** of European Technical Assessment ETA-24/0064
Basic	

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, 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 kmod according to EN 1995-1-1, Table 3.1 and divided by the recommended partial safety factor γ_M = 1.33. The recommended partial safety factor γM should be used in cases where no value is given in national regulations of the Member State where the fastening screws are used.

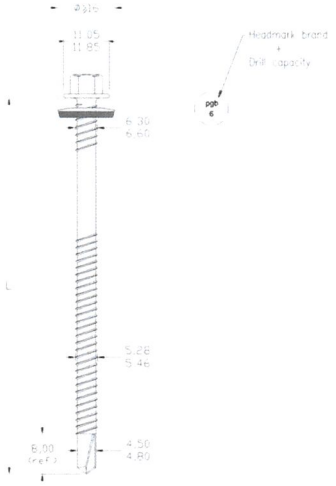
The design tension resistance $N_{R,d}$ is the minimum value of the design values of either pull-through resistance or relevant pull-out resistance for the corresponding connection.

3. **Design Resistance in case of combined Tension and Shear Forces**

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.

Materials

Fastener:	Carbon steel zinc plated with Premium coating
Washer:	Aluminium or Carbon steel with EPDM
Component I:	S280GD to S450GD - EN 10346
Component II:	S235 to S355 - EN 10025 S280GD to S450GD - EN 10346
Drilling capacity:	$\Sigma(t_{N1} + t_{N2} + t_{II}) \leq 6.00$ mm



		t_{II} [mm]					$N_{R,I,k}$ [kN] Pull-through	
		1.50	2.00	2.50	3.00	4.00		
$V_{R,k}$ [kN] / t_{N2} [mm]	0.40	0.80						
	0.45	0.80						
	0.50	1.20						
	0.55	1.20						
	0.60	1.20						
	0.63	1.59						
	0.70	1.59						
	≥ 0.75	1.97						
$N_{R,k}$ [kN] / t_{N1} [mm]	0.40	1.15	1.15	1.15	1.15	1.15	1.15	1.72[1]
	0.45	1.15	1.15	1.15	1.15	1.15	1.15	1.72[1]
	0.50	1.84	1.87	1.87	1.87	1.87	1.87	2.81[1]
	0.55	1.84	1.87	1.87	1.87	1.87	1.87	2.81[1]
	0.60	1.84	1.87	1.87	1.87	1.87	1.87	2.81[1]
	0.63	1.84	2.47	2.47	2.47	2.47	2.47	3.70[1]
	0.70	1.84	2.47	2.47	2.47	2.47	2.47	3.70[1]
	≥ 0.75	1.84	2.93	3.10	3.10	3.10	3.10	4.65[1]
$N_{R,II,k}$ [kN]	Pull-out	1.84	2.93	4.28	5.63	7.28		
u [mm] / t_I [mm]	40	0.9						
	60	1.4						
	80	1.8						
	≥ 100	2.3						

$N_{R,I,k}$ may be increased by 8.3% for component I made of steel S320GD and by 16.6% for component I made of steel S350GD.

$N_{R,II,k}$ may be increased by 8.3% for component II made of steel S320GD and by 16.6% for component II made of steel S350GD and S275.

$V_{R,k}$ may be increased by 8.3% for component I made of steel S320GD and by 16.6% for component I made of steel S350GD.

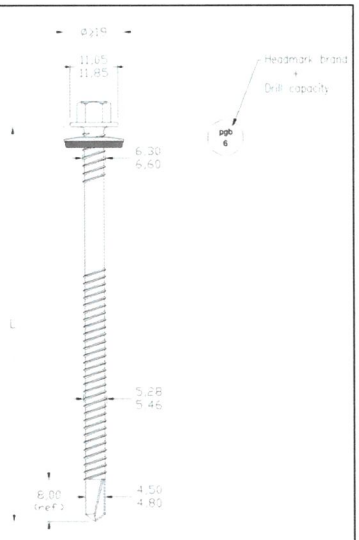
Index [1]: Without reduction factor 2/3 for repeated wind loads.

SWPS-3, SWPS-5, SWPS-7, SWPS-C **Fastening screws for sandwich panels**	**Annex 3** of European Technical Assessment ETA-24/0064
Self-drilling screw SWPS-3 5,5/6,3 x L with washer ≥ ø 16 mm	

Materials

Fastener:	Carbon steel zinc plated with Premium coating
Washer:	Aluminium or Carbon steel with EPDM
Component I:	S280GD to S450GD - EN 10346
Component II:	S235 to S355 - EN 10025 S280GD to S450GD - EN 10346

Drilling capacity: $\Sigma(t_{N1} + t_{N2} + t_{II}) \leq 6.00$ mm



		t_{II} [mm]					$N_{R,I,k}$ [kN] Pull-through	
		1.50	2.00	2.50	3.00	4.00		
$V_{R,k}$ [kN] / t_{N2} [mm]	0.40	0.80						
	0.45	0.80						
	0.50	1.20						
	0.55	1.20						
	0.60	1.20						
	0.63	1.59						
	0.70	1.59						
	≥ 0.75	1.97						
$N_{R,k}$ [kN] / t_{N1} [mm]	0.40	1.24	1.24	1.24	1.24	1.24	1.24	1.86[1]
	0.45	1.24	1.24	1.24	1.24	1.24	1.24	1.86[1]
	0.50	1.84	2.23	2.23	2.23	2.23	2.23	3.34[1]
	0.55	1.84	2.23	2.23	2.23	2.23	2.23	3.34[1]
	0.60	1.84	2.23	2.23	2.23	2.23	2.23	3.34[1]
	0.63	1.84	2.74	2.74	2.74	2.74	2.74	4.11[1]
	0.70	1.84	2.74	2.74	2.74	2.74	2.74	4.11[1]
	≥ 0.75	1.84	2.93	3.69	3.69	3.69	3.69	5.54[1]
$N_{R,II,k}$ [kN]	Pull-out	1.84	2.93	4.28	5.63	7.28		
u [mm] / t_I [mm]	40	0.9						
	60	1.4						
	80	1.8						
	≥ 100	2.3						

$N_{R,I,k}$ may be increased by 8.3% for component I made of steel S320GD and by 16.6% for component I made of steel S350GD.

$N_{R,II,k}$ may be increased by 8.3% for component II made of steel S320GD and by 16.6% for component II made of steel S350GD and S275.

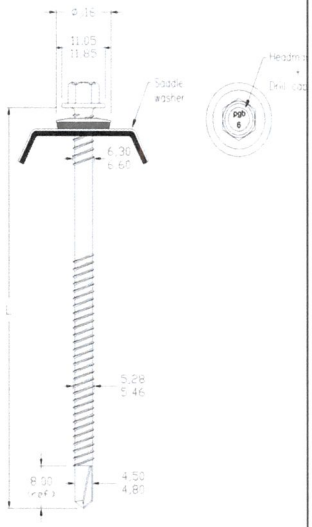
$V_{R,k}$ may be increased by 8.3% for component I made of steel S320GD and by 16.6% for component I made of steel S350GD.

Index [1]: Without reduction factor 2/3 for repeated wind loads.

SWPS-3, SWPS-5, SWPS-7, SWPS-C **Fastening screws for sandwich panels**	**Annex 4**
Self-drilling screw SWPS-3 5,5/6,3 x L with washer ≥ ø 19 mm	of European Technical Assessment ETA-24/0064

Materials

Fastener:	Carbon steel zinc plated with Premium coating
Washer:	Aluminium or Carbon steel with EPDM
Saddle washer:	Aluminium or Carbon steel with PE foam or EPDM
Component I:	S280GD to S450GD - EN 10346
Component II:	S235 to S355 - EN 10025 S280GD to S450GD - EN 10346
Drilling capacity:	$\Sigma(t_{N1} + t_{N2} + t_{II}) \leq 6.00$ mm



		t_{II} [mm]					$N_{R,I,k}$ [kN] Pull-through	
		1.50	2.00	2.50	3.00	4.00		
$V_{R,k}$ [kN] / t_{N2} [mm]	0.40			0.80				
	0.45			0.80				
	0.50			1.20				
	0.55			1.20				
	0.60			1.20				
	0.63			1.59				
	0.70			1.59				
	≥ 0.75			1.97				
$N_{R,k}$ [kN] / t_{N1} [mm]	0.40	1.84	2.93	4.28	5.63	7.28	-	-
	0.45	1.84	2.93	4.28	5.63	7.28	-	-
	0.50	1.84	2.93	4.28	5.63	7.28	-	-
	0.55	1.84	2.93	4.28	5.63	7.28	-	-
	0.60	1.84	2.93	4.28	5.63	7.28	-	-
	0.63	1.84	2.93	4.28	5.63	7.28	-	-
	0.70	1.84	2.93	4.28	5.63	7.28	-	-
	≥ 0.75	1.84	2.93	4.28	5.63	7.28	-	-
$N_{R,II,k}$ [kN]	Pull-out	1.84	2.93	4.28	5.63	7.28		
u [mm] / t_I [mm]	40			0.9				
	60			1.4				
	80			1.8				
	≥ 100			2.3				

$N_{R,I,k}$ may be increased by 8.3% for component I made of steel S320GD and by 16.6% for component I made of steel S350GD.

$N_{R,II,k}$ may be increased by 8.3% for component II made of steel S320GD and by 16.6% for component II made of steel S350GD and S275.

$V_{R,k}$ may be increased by 8.3% for component I made of steel S320GD and by 16.6% for component I made of steel S350GD.

SWPS-3, SWPS-5, SWPS-7, SWPS-C
Fastening screws for sandwich panels

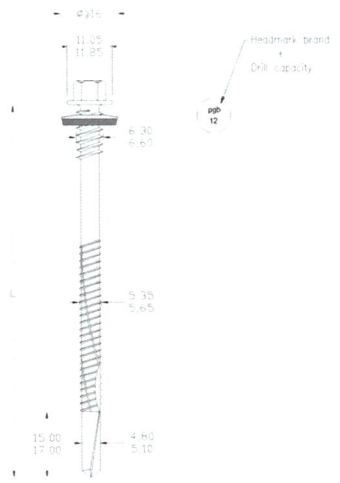
Annex 5

of European Technical Assessment ETA-24/0064

Self-drilling screw SWPS-3 5,5/6,3 x L
with washer ≥ ø 16 mm and saddle washer

Materials

Fastener:	Carbon steel zinc plated with Premium coating
Washer:	Aluminium or Carbon steel with EPDM
Component I:	S280GD to S450GD - EN 10346
Component II:	S235 to S355 - EN 10025
Drilling capacity:	$\Sigma(t_{N1} + t_{N2} + t_{II}) \leq 12.00$ mm



		t_{II} [mm] 3.00	4.00	5.00	6.00	8.00	$N_{R,I,k}$ [kN] Pull-through	
$V_{R,k}$ [kN] / t_{N2} [mm]	0.40	0.80						
	0.45	0.80						
	0.50	1.20						
	0.55	1.20						
	0.60	1.20						
	0.63	1.59						
	0.70	1.59						
	≥ 0.75	1.97						
$N_{R,k}$ [kN] / t_{N1} [mm]	0.40	1.15	1.15	1.15	1.15	1.15	1.15	1.72[1]
	0.45	1.15	1.15	1.15	1.15	1.15	1.15	1.72[1]
	0.50	1.87	1.87	1.87	1.87	1.87	1.87	2.81[1]
	0.55	1.87	1.87	1.87	1.87	1.87	1.87	2.81[1]
	0.60	1.87	1.87	1.87	1.87	1.87	1.87	2.81[1]
	0.63	2.47	2.47	2.47	2.47	2.47	2.47	3.70[1]
	0.70	2.47	2.47	2.47	2.47	2.47	2.47	3.70[1]
	≥ 0.75	3.10	3.10	3.10	3.10	3.10	3.10	4.65[1]
$N_{R,II,k}$ [kN]	Pull-out	4.41	6.43	7.70	8.97	8.97		
u [mm] / t_I [mm]	40	0.9						
	60	1.4						
	80	1.8						
	≥ 100	2.3						

$N_{R,I,k}$ may be increased by 8.3% for component I made of steel S320GD and by 16.6% for component I made of steel S350GD.

$N_{R,II,k}$ may be increased by 8.3% for component II made of steel S320GD and by 16.6% for component II made of steel S350GD and S275.

$V_{R,k}$ may be increased by 8.3% for component I made of steel S320GD and by 16.6% for component I made of steel S350GD.

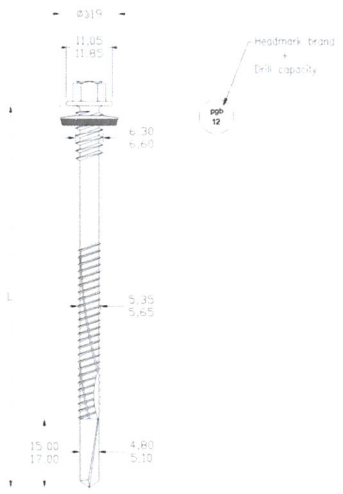
Index [1]: Without reduction factor 2/3 for repeated wind loads.

SWPS-3, SWPS-5, SWPS-7, SWPS-C **Fastening screws for sandwich panels**	**Annex 6** of European Technical Assessment ETA-24/0064
Self-drilling screw SWPS-5 5,5/6,3 x L with washer ≥ ø 16 mm	

Materials

Fastener:	Carbon steel zinc plated with Premium coating
Washer:	Aluminium or Carbon steel with EPDM
Component I:	S280GD to S450GD - EN 10346
Component II:	S235 to S355 - EN 10025

Drilling capacity: $\Sigma(t_{N1} + t_{N2} + t_{II}) \leq 12.00$ mm



		t_{II} [mm] 3.00	4.00	5.00	6.00	8.00	$N_{R,I,k}$ [kN] Pull-through	
$V_{R,k}$ [kN] / t_{N2} [mm]	0.40	0.80						
	0.45	0.80						
	0.50	1.20						
	0.55	1.20						
	0.60	1.20						
	0.63	1.59						
	0.70	1.59						
	≥ 0.75	1.97						
$N_{R,k}$ [kN] / t_{N1} [mm]	0.40	1.24	1.24	1.24	1.24	1.24	1.24	1.86[1]
	0.45	1.24	1.24	1.24	1.24	1.24	1.24	1.86[1]
	0.50	2.23	2.23	2.23	2.23	2.23	2.23	3.34[1]
	0.55	2.23	2.23	2.23	2.23	2.23	2.23	3.34[1]
	0.60	2.23	2.23	2.23	2.23	2.23	2.23	3.34[1]
	0.63	2.74	2.74	2.74	2.74	2.74	2.74	4.11[1]
	0.70	2.74	2.74	2.74	2.74	2.74	2.74	4.11[1]
	≥ 0.75	3.69	3.69	3.69	3.69	3.69	3.69	5.54[1]
$N_{R,II,k}$ [kN]	Pull-out	4.41	6.43	7.70	8.97	8.97		
u [mm] / t_I [mm]	40	0.9						
	60	1.4						
	80	1.8						
	≥ 100	2.3						

$N_{R,I,k}$ may be increased by 8.3% for component I made of steel S320GD and by 16.6% for component I made of steel S350GD.

$N_{R,II,k}$ may be increased by 8.3% for component II made of steel S320GD and by 16.6% for component II made of steel S350GD and S275.

$V_{R,k}$ may be increased by 8.3% for component I made of steel S320GD and by 16.6% for component I made of steel S350GD.

Index [1]: Without reduction factor 2/3 for repeated wind loads.

SWPS-3, SWPS-5, SWPS-7, SWPS-C
Fastening screws for sandwich panels

Self-drilling screw SWPS-5 5,5/6,3 x L
with washer ≥ ø 19 mm

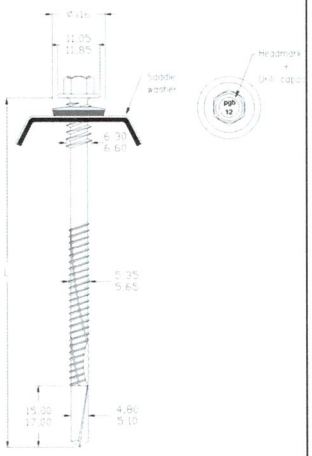
Annex 7

of European Technical Assessment ETA-24/0064

Materials

Fastener:	Carbon steel zinc plated with Premium coating
Washer:	Aluminium or Carbon steel with EPDM
Saddle washer:	Aluminium or Carbon steel with PE foam or EPDM
Component I:	S280GD to S450GD - EN 10346
Component II:	S235 to S355 - EN 10025

Drilling capacity: $\Sigma(t_{N1} + t_{N2} + t_{II}) \leq 12.00$ mm



		t_{II} [mm]					$N_{R,I,k}$ [kN] Pull-through	
		3.00	4.00	5.00	6.00	8.00		
$V_{R,k}$ [kN] / t_{N2} [mm]	0.40			0.80				
	0.45			0.80				
	0.50			1.20				
	0.55			1.20				
	0.60			1.20				
	0.63			1.59				
	0.70			1.59				
	≥ 0.75			1.97				
$N_{R,k}$ [kN] / t_{N1} [mm]	0.40	4.41	6.43	7.70	8.97	8.97	-	-
	0.45	4.41	6.43	7.70	8.97	8.97	-	-
	0.50	4.41	6.43	7.70	8.97	8.97	-	-
	0.55	4.41	6.43	7.70	8.97	8.97	-	-
	0.60	4.41	6.43	7.70	8.97	8.97	-	-
	0.63	4.41	6.43	7.70	8.97	8.97	-	-
	0.70	4.41	6.43	7.70	8.97	8.97	-	-
	≥ 0.75	4.41	6.43	7.70	8.97	8.97	-	-
$N_{R,II,k}$ [kN]	Pull-out	4.41	6.43	7.70	8.97	8.97		
u [mm] / t_I [mm]	40			0.9				
	60			1.4				
	80			1.8				
	≥ 100			2.3				

$N_{R,I,k}$ may be increased by 8.3% for component I made of steel S320GD and by 16.6% for component I made of steel S350GD.

$N_{R,II,k}$ may be increased by 8.3% for component II made of steel S320GD and by 16.6% for component II made of steel S350GD and S275.

$V_{R,k}$ may be increased by 8.3% for component I made of steel S320GD and by 16.6% for component I made of steel S350GD.

SWPS-3, SWPS-5, SWPS-7, SWPS-C
Fastening screws for sandwich panels

Self-drilling screw SWPS-5 5,5/6,3 x L
with washer ≥ ø 16 mm and saddle washer

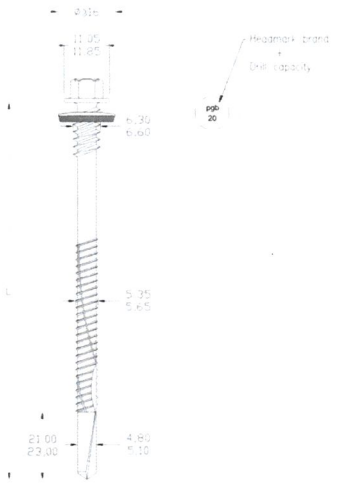
Annex 8

of European Technical Assessment ETA-24/0064

Materials

Fastener:	Carbon steel zinc plated with Premium coating
Washer:	Aluminium or Carbon steel with EPDM
Component I:	S280GD to S450GD - EN 10346
Component II:	S235 to S355 - EN 10025

Drilling capacity: $\Sigma(t_{N1} + t_{N2} + t_{II}) \leq 20.00$ mm



		t_{II} [mm] 8.00	10.00	12.00	14.00	16.00	$N_{R,I,k}$ [kN] Pull-through	
$V_{R,k}$ [kN] / t_{N2} [mm]	0.40	0.80						
	0.45	0.80						
	0.50	1.20						
	0.55	1.20						
	0.60	1.20						
	0.63	1.59						
	0.70	1.59						
	≥ 0.75	1.97						
$N_{R,k}$ [kN] / t_{N1} [mm]	0.40	1.15	1.15	1.15	1.15	1.15	1.15	1.72[1]
	0.45	1.15	1.15	1.15	1.15	1.15	1.15	1.72[1]
	0.50	1.87	1.87	1.87	1.87	1.87	1.87	2.81[1]
	0.55	1.87	1.87	1.87	1.87	1.87	1.87	2.81[1]
	0.60	1.87	1.87	1.87	1.87	1.87	1.87	2.81[1]
	0.63	2.47	2.47	2.47	2.47	2.47	2.47	3.70[1]
	0.70	2.47	2.47	2.47	2.47	2.47	2.47	3.70[1]
	≥ 0.75	3.10	3.10	3.10	3.10	3.10	3.10	4.65[1]
$N_{R,II,k}$ [kN]	Pull-out	10.60	10.60	10.60	10.60	10.60		
u [mm] / t_I [mm]	40	0.9						
	60	1.4						
	80	1.8						
	≥ 100	2.3						

$N_{R,I,k}$ may be increased by 8.3% for component I made of steel S320GD and by 16.6% for component I made of steel S350GD.

$N_{R,II,k}$ may be increased by 8.3% for component II made of steel S320GD and by 16.6% for component II made of steel S350GD and S275.

$V_{R,k}$ may be increased by 8.3% for component I made of steel S320GD and by 16.6% for component I made of steel S350GD.

Index [1]: Without reduction factor 2/3 for repeated wind loads.

SWPS-3, SWPS-5, SWPS-7, SWPS-C
Fastening screws for sandwich panels

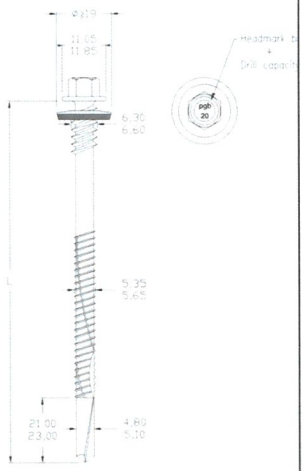
Self-drilling screw SWPS-7 5,5/6,3 x L
with washer ≥ ø 16 mm

Annex 9

of European
Technical Assessment
ETA-24/0064

Materials

Fastener:	Carbon steel zinc plated with Premium coating
Washer:	Aluminium or Carbon steel with EPDM
Component I:	S280GD to S450GD - EN 10346
Component II:	S235 to S355 - EN 10025
Drilling capacity:	$\Sigma(t_{N1} + t_{N2} + t_{II}) \leq 20.00$ mm



		t_{II} [mm] 8.00	10.00	12.00	14.00	16.00	$N_{R,I,k}$ [kN] Pull-through	
$V_{R,k}$ [kN] / t_{N2} [mm]	0.40	0.80						
	0.45	0.80						
	0.50	1.20						
	0.55	1.20						
	0.60	1.20						
	0.63	1.59						
	0.70	1.59						
	≥ 0.75	1.97						
$N_{R,k}$ [kN] / t_{N1} [mm]	0.40	1.24	1.24	1.24	1.24	1.24	1.24	1.86[1]
	0.45	1.24	1.24	1.24	1.24	1.24	1.24	1.86[1]
	0.50	2.23	2.23	2.23	2.23	2.23	2.23	3.34[1]
	0.55	2.23	2.23	2.23	2.23	2.23	2.23	3.34[1]
	0.60	2.23	2.23	2.23	2.23	2.23	2.23	3.34[1]
	0.63	2.74	2.74	2.74	2.74	2.74	2.74	4.11[1]
	0.70	2.74	2.74	2.74	2.74	2.74	2.74	4.11[1]
	≥ 0.75	3.69	3.69	3.69	3.69	3.69	3.69	5.54[1]
$N_{R,II,k}$ [kN]	Pull-out	10.60	10.60	10.60	10.60	10.60		
u [mm] / t_I [mm]	40	0.9						
	60	1.4						
	80	1.8						
	≥ 100	2.3						

$N_{R,I,k}$ may be increased by 8.3% for component I made of steel S320GD and by 16.6% for component I made of steel S350GD.

$N_{R,II,k}$ may be increased by 8.3% for component II made of steel S320GD and by 16.6% for component II made of steel S350GD and S275.

$V_{R,k}$ may be increased by 8.3% for component I made of steel S320GD and by 16.6% for component I made of steel S350GD.

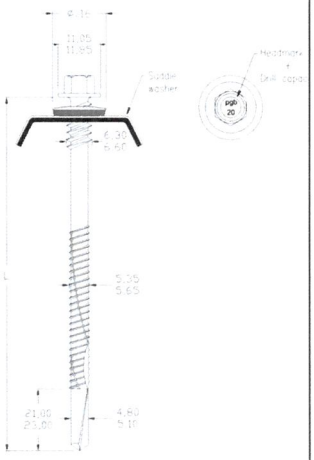
Index [1]: Without reduction factor 2/3 for repeated wind loads.

SWPS-3, SWPS-5, SWPS-7, SWPS-C **Fastening screws for sandwich panels**	**Annex 10** of European Technical Assessment ETA-24/0064
Self-drilling screw SWPS-7 5,5/6,3 x L with washer ≥ ø 19 mm	

Materials

Fastener:	Carbon steel zinc plated with Premium coating
Washer:	Aluminium or Carbon steel with EPDM
Saddle washer:	Aluminium or Carbon steel with PE foam or EPDM
Component I:	S280GD to S450GD - EN 10346
Component II:	S235 to S355 - EN 10025

Drilling capacity: $\Sigma(t_{N1} + t_{N2} + t_{II}) \leq 20.00$ mm



		t_{II} [mm] 8.00	10.00	12.00	14.00	16.00	$N_{R,I,k}$ [kN] Pull-through	
$V_{R,k}$ [kN] t_{N2} [mm]	0.40	0.80						
	0.45	0.80						
	0.50	1.20						
	0.55	1.20						
	0.60	1.20						
	0.63	1.59						
	0.70	1.59						
	≥ 0.75	1.97						
$N_{R,k}$ [kN] t_{N1} [mm]	0.40	10.60	10.60	10.60	10.60	10.60	-	-
	0.45	10.60	10.60	10.60	10.60	10.60	-	-
	0.50	10.60	10.60	10.60	10.60	10.60	-	-
	0.55	10.60	10.60	10.60	10.60	10.60	-	-
	0.60	10.60	10.60	10.60	10.60	10.60	-	-
	0.63	10.60	10.60	10.60	10.60	10.60	-	-
	0.70	10.60	10.60	10.60	10.60	10.60	-	-
	≥ 0.75	10.60	10.60	10.60	10.60	10.60	-	-
$N_{R,II,k}$ [kN]	Pull-out	10.60	10.60	10.60	10.60	10.60		
u [mm] t_I [mm]	40	0.9						
	60	1.4						
	80	1.8						
	≥ 100	2.3						

$N_{R,I,k}$ may be increased by 8.3% for component I made of steel S320GD and by 16.6% for component I made of steel S350GD.

$N_{R,II,k}$ may be increased by 8.3% for component II made of steel S320GD and by 16.6% for component II made of steel S350GD and S275.

$V_{R,k}$ may be increased by 8.3% for component I made of steel S320GD and by 16.6% for component I made of steel S350GD.

SWPS-3, SWPS-5, SWPS-7, SWPS-C
Fastening screws for sandwich panels

Self-drilling screw SWPS-7 5,5/6,3 x L
with washer ≥ ø 16 mm and saddle washer

Annex 11

of European Technical Assessment ETA-24/0064

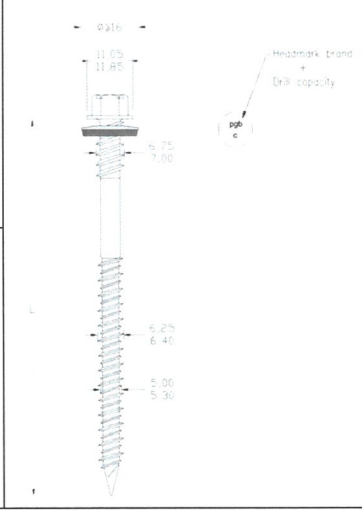
Materials

Fastener: Carbon steel zinc plated with Premium coating

Washer: Aluminium or Carbon steel with EPDM

Component I: S280GD to S450GD - EN 10346

Component II: Coniferous timber ≥ C24 - EN 14081



Drilling capacity: $\Sigma(t_{N1} + t_{N2}) \leq 2.00$ mm

Timber structure:

$M_{y,Rk} = 12.68$ Nm

$f_{ax,k} = 8.36$ N/mm² for $l_{ef} \geq 25$ mm, $\rho_a = 350$ kg/m³

		l_{ef} [mm]						$N_{R,I,k}$ [kN] Pull-through	
		35	40	45	50	55	60		
$V_{R,k}$ [kN] / t_{N2} [mm]	0.40	0.76							
	0.45	0.76							
	0.50	1.11							
	0.55	1.11							
	0.60	1.11							
	0.63	1.42							
	0.70	1.42							
	≥ 0.75	1.66							
$N_{R,k}$ [kN] / t_{N1} [mm]	0.40	1.15	1.15	1.15	1.15	1.15	1.15	1.15	1.72[1]
	0.45	1.15	1.15	1.15	1.15	1.15	1.15	1.15	1.72[1]
	0.50	1.87	1.87	1.87	1.87	1.87	1.87	1.87	2.81[1]
	0.55	1.87	1.87	1.87	1.87	1.87	1.87	1.87	2.81[1]
	0.60	1.87	1.87	1.87	1.87	1.87	1.87	1.87	2.81[1]
	0.63	2.47	2.47	2.47	2.47	2.47	2.47	2.47	3.70[1]
	0.70	2.47	2.47	2.47	2.47	2.47	2.47	2.47	3.70[1]
	≥ 0.75	3.10	3.10	3.10	3.10	3.10	3.10	3.10	4.65[1]
$N_{R,II,k}$ [kN]	Pull-out	3.26	4.05	4.84	4.84	4.84	4.84		
u [mm] / t_I [mm]	40	0.9							
	60	1.4							
	80	1.8							
	≥ 100	2.3							

$N_{R,I,k}$ may be increased by 8.3% for component I made of steel S320GD and by 16.6% for component I made of steel S350GD to S450GD.

$V_{R,k}$ may be increased by 8.3% for component I made of steel S320GD and by 16.6% for component I made of steel S350GD to S450GD.

Index [1]: Without reduction factor 2/3 for repeated wind loads.

SWPS-3, SWPS-5, SWPS-7, SWPS-C **Fastening screws for sandwich panels**	**Annex 12** of European Technical Assessment ETA-24/0064
Self-drilling screws SWPS-C 6,4/7,0 x L with washer ≥ ø 16 mm	

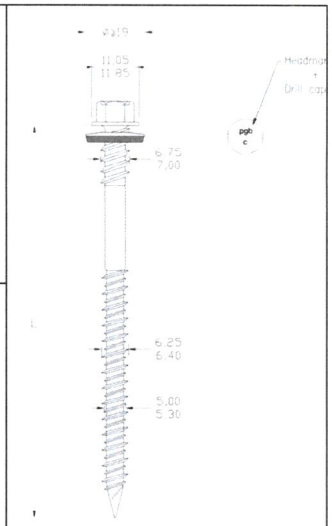
Materials

Fastener: Carbon steel zinc plated with Premium coating

Washer: Aluminium or Carbon steel with EPDM

Component I: S280GD to S450GD - EN 10346

Component II: Coniferous timber ≥ C24 - EN 14081



Drilling capacity: $\Sigma(t_{N1} + t_{N2}) \leq 2.00$ mm

Timber structure:

$M_{y,Rk} = 12.68$ Nm

$f_{ax,k} = 8.36$ N/mm² for $l_{ef} \geq 25$ mm, $\rho_a = 350$ kg/m³

		l_{ef} [mm]						$N_{R,I,k}$ [kN] Pull-through	
		35	40	45	50	55	60		
$V_{R,k}$ [kN] / t_{N2} [mm]	0.40	0.76							
	0.45	0.76							
	0.50	1.11							
	0.55	1.11							
	0.60	1.11							
	0.63	1.42							
	0.70	1.42							
	≥ 0.75	1.66							
$N_{R,k}$ [kN] / t_{N1} [mm]	0.40	1.24	1.24	1.24	1.24	1.24	1.24	1.24	1.86[1]
	0.45	1.24	1.24	1.24	1.24	1.24	1.24	1.24	1.86[1]
	0.50	2.23	2.23	2.23	2.23	2.23	2.23	2.23	3.34[1]
	0.55	2.23	2.23	2.23	2.23	2.23	2.23	2.23	3.34[1]
	0.60	2.23	2.23	2.23	2.23	2.23	2.23	2.23	3.34[1]
	0.63	2.74	2.74	2.74	2.74	2.74	2.74	2.74	4.11[1]
	0.70	2.74	2.74	2.74	2.74	2.74	2.74	2.74	4.11[1]
	≥ 0.75	3.26	3.69	3.69	3.69	3.69	3.69	3.69	5.54[1]
$N_{R,II,k}$ [kN]	Pull-out	3.26	4.05	4.84	4.84	4.84	4.84		
u [mm] / t_I [mm]	40	0.9							
	60	1.4							
	80	1.8							
	≥ 100	2.3							

$N_{R,I,k}$ may be increased by 8.3% for component I made of steel S320GD and by 16.6% for component I made of steel S350GD to S450GD.

$V_{R,k}$ may be increased by 8.3% for component I made of steel S320GD and by 16.6% for component I made of steel S350GD to S450GD.

Index [1]: Without reduction factor 2/3 for repeated wind loads.

SWPS-3, SWPS-5, SWPS-7, SWPS-C
Fastening screws for sandwich panels

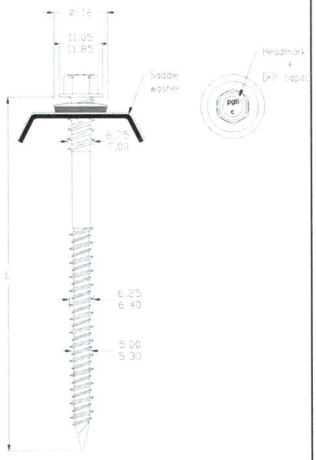
Self-drilling screws SWPS-C 6,4/7,0 x L
with washer ≥ ø 19 mm

Annex 13

of European Technical Assessment ETA-24/0064

Materials

Fastener:	Carbon steel zinc plated with Premium coating
Washer:	Aluminium or Carbon steel with EPDM
Saddle washer:	Aluminium or Carbon steel with PE foam or EPDM
Component I:	S280GD to S450GD - EN 10346
Component II:	Coniferous timber ≥ C24 - EN 14081



Drilling capacity: $\Sigma(t_{N1} + t_{N2}) \leq 2.00$ mm

Timber structure:

$M_{y,Rk} = 12.68$ Nm

$f_{ax,k} = 8.36$ N/mm² for $l_{ef} \geq 25$ mm, $\rho_a = 350$ kg/m³

		l_{ef} [mm]						$N_{R,I,k}$ [kN] Pull-through	
		35	40	45	50	55	60		
$V_{R,k}$ [kN] / t_{N2} [mm]	0.40	0.76							
	0.45	0.76							
	0.50	1.11							
	0.55	1.11							
	0.60	1.11							
	0.63	1.42							
	0.70	1.42							
	≥ 0.75	1.66							
$N_{R,k}$ [kN] / t_{N1} [mm]	0.40	3.26	4.05	4.84	4.84	4.84	4.84	-	-
	0.45	3.26	4.05	4.84	4.84	4.84	4.84	-	-
	0.50	3.26	4.05	4.84	4.84	4.84	4.84	-	-
	0.55	3.26	4.05	4.84	4.84	4.84	4.84	-	-
	0.60	3.26	4.05	4.84	4.84	4.84	4.84	-	-
	0.63	3.26	4.05	4.84	4.84	4.84	4.84	-	-
	0.70	3.26	4.05	4.84	4.84	4.84	4.84	-	-
	≥ 0.75	3.26	4.05	4.84	4.84	4.84	4.84	-	-
$N_{R,II,k}$ [kN]	Pull-out	3.26	4.05	4.84	4.84	4.84	4.84		
u [mm] / t_I [mm]	40	0.9							
	60	1.4							
	80	1.8							
	≥ 100	2.3							

$N_{R,I,k}$ may be increased by 8.3% for component I made of steel S320GD and by 16.6% for component I made of steel S350GD to S450GD.

$V_{R,k}$ may be increased by 8.3% for component I made of steel S320GD and by 16.6% for component I made of steel S350GD to S450GD.

SWPS-3, SWPS-5, SWPS-7, SWPS-C
Fastening screws for sandwich panels

Self-drilling screws SWPS-C 6,4/7,0 x L
with washer ≥ ø 16 mm and saddle washer

Annex 14

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Technical Assessment
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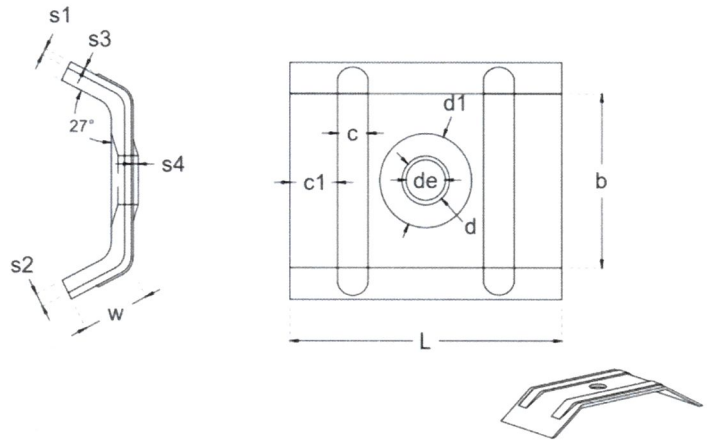
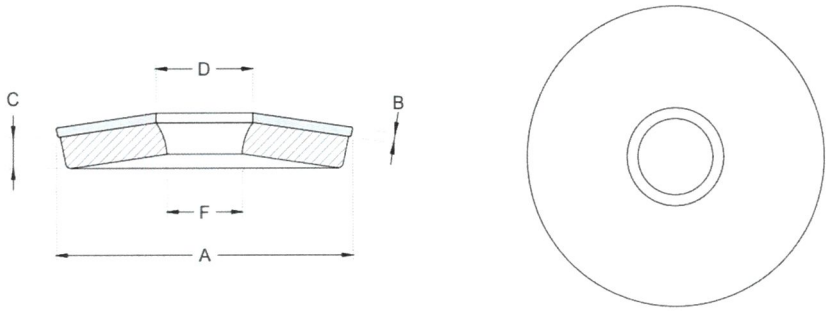


Size	L	b	d	d1	de	w	s1	s2	c	c1	s3
40 x 25	40	25	6,95 ÷ 7,45	13,5	4,6 ÷ 5,4	10	0,9 ÷ 1,1	1,8 ÷ 2,2	4,5	6,95 ÷ 7,45	0,4

Materials:
Aluminum or Carbon steel with PE foam or EPDM

SWPS-3, SWPS-5, SWPS-7, SWPS-C **Fastening screws for sandwich panels**	**Annex 15** of European Technical Assessment ETA-24/0064
Saddle washer	



Dimensions					
Size	A	B	C	D	F
6,3 x 16	15,80 16,20	0,70 0,90	2,30 2,50	6,75 7,25	5,10 5,60

Dimensions					
Size	A	B	C	D	F
6,3 x 19	18,80 19,20	0,70 0,90	2,30 2,50	6,75 7,25	5,10 5,60

Materials:
Aluminum or Carbon steel with EPDM

SWPS-3, SWPS-5, SWPS-7, SWPS-C **Fastening screws for sandwich panels**	**Annex 16** of European Technical Assessment ETA-24/0064
Washer	