Designated according to The Construction Products (Amendment etc.) (EU Exit) Regulations 2020

UK Technical Assessment	UKTA-0836-22/6409 of 18/10/2022
Technical Assessment Body issuing the UK Technical Assessment:	British Board of Agrément
Trade name of the construction product:	OC 5.5/6.3xL, ON 5.5/6.3xL, OCS 5.5/6.3xL, ONS 5.5/6.3xL
Product family to which the construction product belongs:	Area Code 33, Fastening screws for sandwich panels
Manufacturer:	RAWLPLUG LTD Skibo Drive Thornliebank Industrial Estate Glasgow G46 8JR
Manufacturing plants:	Manufacturing Plant 2 Manufacturing Plant 22 Manufacturing Plant 23 Manufacturing Plant 24
This UK Technical Assessment contains:	13 pages including 8 annexes which form an integral part of this assessment
This UK Technical Assessment is issued in accordance with The Construction Products (Amendment etc.) (EU Exit) Regulations 2020 on the basis of:	UKAD 330047-01-0602 *Fastening screws for sandwich panels*

1 Technical description of the product

The fastening screws for sandwich panels OC 5.5/6.3xL, ON 5.5/6.3xL, OCS 5.5/6.3xL and ONS 5.5/6.3xL are a self-drilling and self-tapping screws listed in Table 1. Screws are completed with aluminum washer and an EPDM sealing ring. For details see the Annexes 2 to 7.

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

Table 1

No.	Screw	Material	Annex
1	OC 5.5/6.3xL	galvanized carbon steel	2
2	OC 5.5/6.3xL		3
3	ON 5.5/6.3xL		4
4	ON 5.5/6.3xL		5
5	OCS 5.5/6.3xL	stainless steel	6
6	ONS 5.5/6.3xL		7

2 Specification of the intended use in accordance with the applicable UK Assessment Document (hereinafter UKAD)

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 BS EN ISO 12944-2:2017 are manufactured from of stainless steel.

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 UK 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 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 7.

The design values shall be determined according to Annex 8 and UKAD 330047-01-0602.

For the corrosion protection the rules given in BS EN 1993-1-3:2006 and BS EN 1993-1-4:2006 + A2:2020 shall be taken into account.

3.2 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.

3.3 Health, hygiene and the environment (BWR 3)

Not relevant

3.4 Safety and accessibility in use (BWR 4)

Not relevant

3.5 Protection against noise (BWR 5)

Not relevant

3.6 Energy economy and heat retention (BWR 6)

Not relevant

3.7 Sustainable use of natural resources (BWR 7)

No performance assessed.

4 Assessment and verification of constancy of performance (hereinafter AVCP) system applied

4.1 System of assessment and verification of constancy of performance

According to UKAD No. 330047-01-0602 and Annex V of the Construction Products Regulation (Regulation (EU) 305/2011 as brought into UK law and amended, the system of assessment and verification of constancy of performance (AVCP) 2+ applies.

5 Technical details necessary for the implementation of the AVCP system, as provided for in the applicable UKAD

Technical details necessary for the implementation of the AVCP system are laid down in the control plan deposited with the British Board of Agrément and made available to the UK Approved Bodies involved in the conformity attestation process.

5.1 UKCA marking for the product/ system must contain the following information:

- Identification number of the Approved Body
- Name/address of the manufacturer of the product/ system
- Marking with intention of clarification of intended use
- Date of marking
- Number of certificate of constancy of performance
- UKTA number.

On behalf of the British Board of Agrément 	
Date of Issue: 18 October 2022	**Hardy Giesler** Chief Executive Officer

British Board of Agrément,
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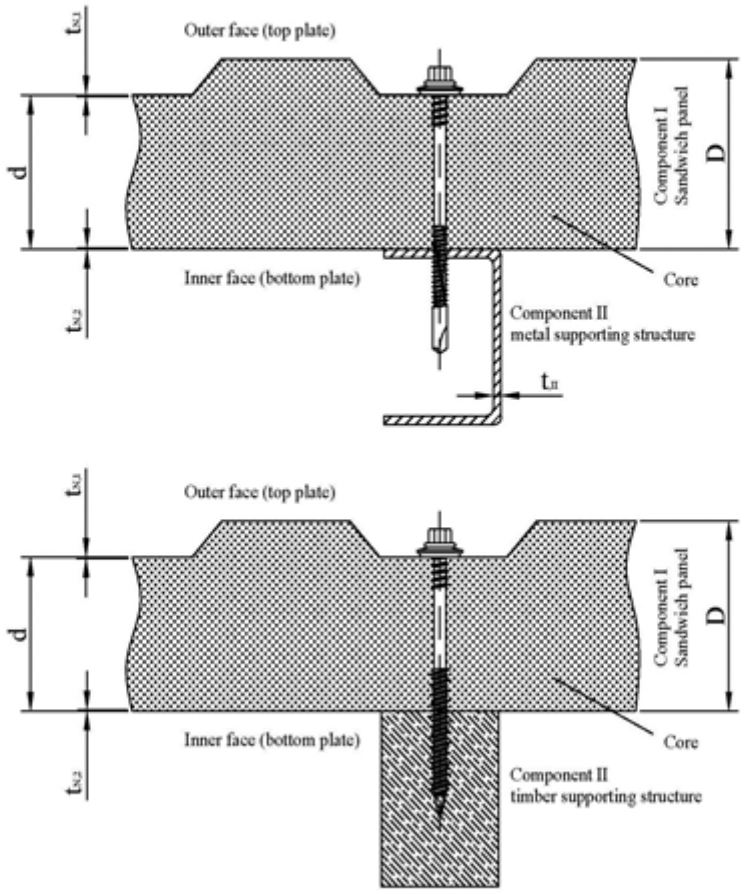
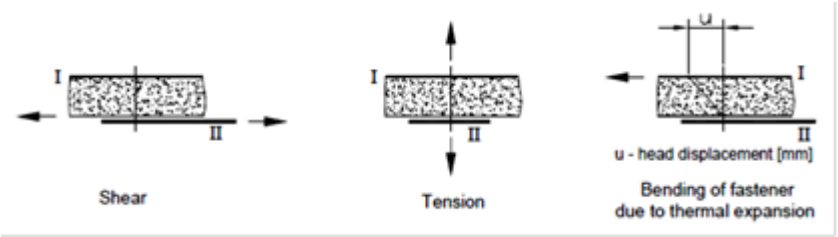
ANNEXES

This annex applies to the product described in the main body of the UK Technical Assessment.

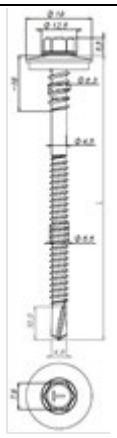
Example of execution of a connection



Loading conditions



Fastening screws for sandwich panels	
Example of a connection. Loading conditions	**Annex 1**

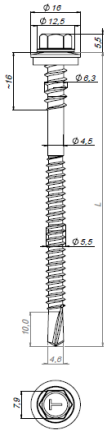
Materials Fastener: carbon steel – SAE 1022, quenched, tempered and galvanized (≥ 12 µm) Washer: metallic washer made of carbon steel with EPDM sealing ring Component I: S280GD, S320GD or S350GD – BS EN 10346:2015 Component II: S235 – BS EN 10025-1:2004 S280GD, S320GD or S350GD – BS EN 10346:2015	
Drilling capacity: $\Sigma(t_{N2} + t_{II}) \leq 6$ mm	
Timber substructures no performance assessed	

Component II: t_{II} in [mm]			**1.50**	**2.00**	**2.50**	**3.00**	**4.00**	**5.00**	**6.00**	**8.00**	**≥ 10.00**
Component I: $t_{N,1}$ or $t_{N,2}$ in [mm]	**$V_{R,k}$ in [kN]**	**0.40**	0.98	0.98	0.98	0.98	0.98	0.98	—	—	—
		0.50	1.63	1.63	1.63	1.63	1.63	1.63	—	—	—
		0.55	1.63	1.63	1.63	1.63	1.63	1.63	—	—	—
		0.63	1.91	1.91	1.91	1.91	1.91	1.91	—	—	—
		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	—	—	—
	$N_{R,k}$ in [kN]	**0.40**	1.18	1.18	1.18	1.93	1.93	1.93	—	—	—
		0.50	1.18	1.18	1.18	3.45	3.45	3.45	—	—	—
		0.55	1.18	1.18	1.18	3.45	3.45	3.45	—	—	—
		0.63	1.18	1.18	1.18	4.58	4.58	4.58	—	—	—
		0.75	1.18	1.18	1.18	5.38	5.38	5.38	—	—	—
		0.88	1.18	1.18	1.18	5.38	5.38	5.38	—	—	—
		1.00	1.18	1.18	1.18	5.38	5.38	5.38	—	—	—
max. head displacement u depending on the sandwich panel thickness in [mm]		**30**	10	10	10	0.7	0.7	0.7	—	—	—
		40	10	10	10	0.7	0.7	0.7	—	—	—
		50	10	10	10	0.7	0.7	0.7	—	—	—
		60	10	10	10	2	2	2	—	—	—
		70	10	10	10	2	2	2	—	—	—
		80	10	10	10	2	2	2	—	—	—
		90	10	10	10	10	3	3	—	—	—
		100	10	10	10	10	3	3	—	—	—
		120	10	10	10	10	3	3	—	—	—
		≥ 140	10	10	10	10	3	3	—	—	—

Fastening screws for sandwich panels
OC 5.5/6.3xL, ON 5.5/6.3xL, OCS 5.5/6.3xL and ONS 5.5/6.3xL

Annex 2

Self-drilling screw OC 5.5/6.3xL with hexagon head and sealing washer EPDM T19

Materials Fastener: carbon steel – SAE 1022, quenched, tempered and galvanized (≥ 12 µm) Washer: metallic washer made of carbon steel with EPDM sealing ring Component I: S280GD, S320GD or S350GD – BS EN 10346:2015 Component II: S235 – BS EN 10025-1:2004 S280GD, S320GD or S350GD – BS EN 10346:2015	
Drilling capacity: $\Sigma(t_{N2} + t_{II}) \leq 6$ mm	
Timber substructures no performance assessed	

Component II: t_{II} in [mm]			1.50	2.00	2.50	3.00	4.00	5.00	6.00	8.00	≥ 10.00
Component I: $t_{N,1}$ or $t_{N,2}$ in [mm]	$V_{R,k}$ in [kN]	0.40	0.98	0.98	0.98	0.98	0.98	0.98	—	—	—
		0.50	1.63	1.63	1.63	1.63	1.63	1.63	—	—	—
		0.55	1.63	1.63	1.63	1.63	1.63	1.63	—	—	—
		0.63	1.91	1.91	1.91	1.91	1.91	1.91	—	—	—
		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	—	—	—
	$N_{R,k}$ in [kN]	0.40	1.18	1.18	1.18	1.65	1.65	1.65	—	—	—
		0.50	1.18	1.18	1.18	2.91	2.91	2.91	—	—	—
		0.55	1.18	1.18	1.18	2.91	2.91	2.91	—	—	—
		0.63	1.18	1.18	1.18	3.87	3.87	3.87	—	—	—
		0.75	1.18	1.18	1.18	4.55	4.55	4.55	—	—	—
		0.88	1.18	1.18	1.18	4.55	4.55	4.55	—	—	—
		1.00	1.18	1.18	1.18	4.55	4.55	4.55	—	—	—
max. head displacement u depending on the sandwich panel thickness in [mm]		30	10	10	10	0.7	0.7	0.7	—	—	—
		40	10	10	10	0.7	0.7	0.7	—	—	—
		50	10	10	10	0.7	0.7	0.7	—	—	—
		60	10	10	10	2	2	2	—	—	—
		70	10	10	10	2	2	2	—	—	—
		80	10	10	10	2	2	2	—	—	—
		90	10	10	10	10	3	3	—	—	—
		100	10	10	10	10	3	3	—	—	—
		120	10	10	10	10	3	3	—	—	—
		≥ 140	10	10	10	10	3	3	—	—	—

Fastening screws for sandwich panels
OC 5.5/6.3xL, ON 5.5/6.3xL, OCS 5.5/6.3xL and ONS 5.5/6.3xL

Annex 3

Self-drilling screw OC 5.5/6.3xL with hexagon head and sealing washer EPDM T16

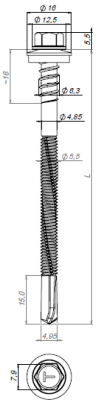
Materials Fastener: carbon steel – SAE 1022, quenched, tempered and galvanized (≥ 12 µm) Washer: metallic washer made of carbon steel with EPDM sealing ring Component I: S280GD, S320GD or S350GD – BS EN 10346:2015 Component II: S235 – BS EN 10025-1:2004 S280GD, S320GD or S350GD – BS EN 10346:2015	
Drilling capacity: $\Sigma(t_{N2} + t_{II}) \leq 12$ mm	
Timber substructures no performance assessed	

Component II: t_{II} in [mm]			3.00	4.00	5.00	6.00	8.00	10.00	11.00	12.00	14.00
Component I: $t_{N,1}$ or $t_{N,2}$ in [mm]	$V_{R,k}$ in [kN]	0.40	1.07	1.07	1.07	1.07	1.07	1.07	1.07	—	—
		0.50	1.73	1.73	1.73	1.73	1.73	1.73	1.73	—	—
		0.55	1.73	1.73	1.73	1.73	1.73	1.73	1.73	—	—
		0.63	1.96	1.96	1.96	1.96	1.96	1.96	1.96	—	—
		0.75	1.96	1.96	1.96	1.96	1.96	1.96	1.96	—	—
		0.88	1.96	1.96	1.96	1.96	1.96	1.96	1.96	—	—
		1.00	1.96	1.96	1.96	1.96	1.96	1.96	1.96	—	—
	$N_{R,k}$ in [kN]	0.40	1.93	1.93	1.93	1.93	1.93	1.93	1.93	—	—
		0.50	3.45	3.45	3.45	3.45	3.45	3.45	3.45	—	—
		0.55	3.45	3.45	3.45	3.45	3.45	3.45	3.45	—	—
		0.63	4.58	4.58	4.58	4.58	4.58	4.58	4.58	—	—
		0.75	5.38	5.38	5.38	5.38	5.38	5.38	5.38	—	—
		0.88	5.38	5.38	5.38	5.38	5.38	5.38	5.38	—	—
		1.00	5.38	5.38	5.38	5.38	5.38	5.38	5.38	—	—
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	—	—
		50	0.7	0.7	0.7	0.7	0.7	0.7	0.7	—	—
		60	2	2	2	2	2	2	2	—	—
		70	2	2	2	2	2	2	2	—	—
		80	2	2	2	2	2	2	2	—	—
		90	3	3	3	3	3	3	3	—	—
		100	3	3	3	3	3	3	3	—	—
		120	3	3	3	3	3	3	3	—	—
		≥ 140	3	3	3	3	3	3	3	—	—

Fastening screws for sandwich panels
OC 5.5/6.3xL, ON 5.5/6.3xL, OCS 5.5/6.3xL and ONS 5.5/6.3xL

Annex 4

Self-drilling screw ON 5.5/6.3xL with hexagon head and sealing washer EPDM T19

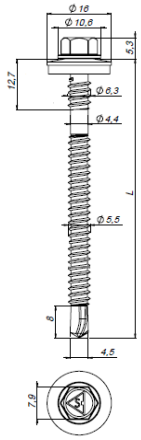
Materials Fastener: carbon steel – SAE 1022, quenched, tempered and galvanized (≥ 12 µm) Washer: metallic washer made of carbon steel with EPDM sealing ring Component I: S280GD, S320GD or S350GD – BS EN 10346:2015 Component II: S235 – BS EN 10025-1:2004 S280GD, S320GD or S350GD – BS EN 10346:2015	
Drilling capacity: $\Sigma(t_{N2} + t_{II}) \leq 12$ mm	
Timber substructures no performance assessed	

Component II: t_{II} in [mm]			3.00	4.00	5.00	6.00	8.00	10.00	11.00	12.00	14.00
Component I: $t_{N,1}$ or $t_{N,2}$ in [mm]	$V_{R,k}$ in [kN]	0.40	1.07	1.07	1.07	1.07	1.07	1.07	1.07	—	—
		0.50	1.73	1.73	1.73	1.73	1.73	1.73	1.73	—	—
		0.55	1.73	1.73	1.73	1.73	1.73	1.73	1.73	—	—
		0.63	1.96	1.96	1.96	1.96	1.96	1.96	1.96	—	—
		0.75	1.96	1.96	1.96	1.96	1.96	1.96	1.96	—	—
		0.88	1.96	1.96	1.96	1.96	1.96	1.96	1.96	—	—
		1.00	1.96	1.96	1.96	1.96	1.96	1.96	1.96	—	—
	$N_{R,k}$ in [kN]	0.40	1.65	1.65	1.65	1.65	1.65	1.65	1.65	—	—
		0.50	2.91	2.91	2.91	2.91	2.91	2.91	2.91	—	—
		0.55	2.91	2.91	2.91	2.91	2.91	2.91	2.91	—	—
		0.63	3.87	3.87	3.87	3.87	3.87	3.87	3.87	—	—
		0.75	4.55	4.55	4.55	4.55	4.55	4.55	4.55	—	—
		0.88	4.55	4.55	4.55	4.55	4.55	4.55	4.55	—	—
		1.00	4.55	4.55	4.55	4.55	4.55	4.55	4.55	—	—
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	—	—
		50	0.7	0.7	0.7	0.7	0.7	0.7	0.7	—	—
		60	2	2	2	2	2	2	2	—	—
		70	2	2	2	2	2	2	2	—	—
		80	2	2	2	2	2	2	2	—	—
		90	3	3	3	3	3	3	3	—	—
		100	3	3	3	3	3	3	3	—	—
		120	3	3	3	3	3	3	3	—	—
		≥ 140	3	3	3	3	3	3	3	—	—

Fastening screws for sandwich panels
OC 5.5/6.3xL, ON 5.5/6.3xL, OCS 5.5/6.3xL and ONS 5.5/6.3xL

Annex 5

Self-drilling screw ON 5.5/6.3xL with hexagon head and sealing washer EPDM T16

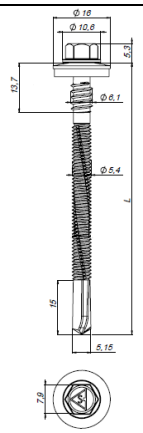
Materials Fastener: stainless steel – SAE 304 Washer: metallic washer made of stainless steel with EPDM sealing ring Component I: S280GD, S320GD or S350GD – BS EN 10346:2015 Component II: S235 – BS EN 10025-1:2004 S280GD, S320GD or S350GD – BS EN 10346:2015	
Drilling capacity: $\Sigma(t_{N2} + t_{II}) \leq 6$ mm	
Timber substructures no performance assessed	

Component II: t_{II} in [mm]			1.50	2.00	2.50	3.00	4.00	5.00	6.00	8.00	≥ 10.00
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	1.15	1.15	1.15	1.15	1.15	1.15	—	—	—
		0.55	1.15	1.15	1.15	1.15	1.15	1.15	—	—	—
		0.63	1.59	1.59	1.59	1.59	1.59	1.59	—	—	—
		0.75	1.59	1.59	1.59	1.59	1.59	1.59	—	—	—
		0.88	1.59	1.59	1.59	1.59	1.59	1.59	—	—	—
		1.00	1.59	1.59	1.59	1.59	1.59	1.59	—	—	—
	$N_{R,k}$ in [kN]	**0.40**	1.06	1.06	1.42	1.42	1.42	1.42	—	—	—
		0.50	1.06	1.06	2.60	2.60	2.60	2.60	—	—	—
		0.55	1.06	1.06	2.60	2.60	2.60	2.60	—	—	—
		0.63	1.06	1.06	2.99	2.99	3.61	3.61	—	—	—
		0.75	1.06	1.06	2.99	2.99	3.99	3.99	—	—	—
		0.88	1.06	1.06	2.99	2.99	3.99	3.99	—	—	—
		1.00	1.06	1.06	2.99	2.99	3.99	3.99	—	—	—
max. head displacement u depending on the sandwich panel thickness in [mm]		**30**	7	7	7	1.5	1.5	1.5	—	—	—
		40	7	7	7	1.5	1.5	1.5	—	—	—
		50	7	7	7	1.5	1.5	1.5	—	—	—
		60	25	15	15	7	7	7	—	—	—
		70	25	15	15	7	7	7	—	—	—
		80	25	15	15	7	7	7	—	—	—
		90	25	21	21	12	12	12	—	—	—
		100	25	21	21	12	12	12	—	—	—
		120	25	21	21	12	12	12	—	—	—
		≥ 140	25	21	21	12	12	12	—	—	—

Fastening screws for sandwich panels
OC 5.5/6.3xL, ON 5.5/6.3xL, OCS 5.5/6.3xL and ONS 5.5/6.3xL

Annex 6

Self-drilling screw OCS 5.5/6.3xL with hexagon head and sealing washer EPDM S16

Materials Fastener: stainless steel – SAE 304 Washer: metallic washer made of stainless steel with EPDM sealing ring Component I: S280GD, S320GD or S350GD – BS EN 10346:2015 Component II: S235 – BS EN 10025-1:2004 S280GD, S320GD or S350GD – BS EN 10346:2015	
Drilling capacity: $\Sigma(t_{N2} + t_{II}) \leq 12$ mm	
Timber substructures no performance assessed	

Component II: t_{II} in [mm]			3.00	4.00	5.00	6.00	8.00	10.00	11.00	12.00	14.00
Component I: $t_{N,1}$ or $t_{N,2}$ in [mm]	$V_{R,k}$ in [kN]	0.40	0.78	0.78	0.78	0.78	0.78	0.78	0.78	—	—
		0.50	1.29	1.29	1.29	1.29	1.29	1.29	1.29	—	—
		0.55	1.29	1.29	1.29	1.29	1.29	1.29	1.29	—	—
		0.63	1.94	1.94	1.94	1.94	1.94	1.94	1.94	—	—
		0.75	1.94	1.94	1.94	1.94	1.94	1.94	1.94	—	—
		0.88	1.94	1.94	1.94	1.94	1.94	1.94	1.94	—	—
		1.00	1.94	1.94	1.94	1.94	1.94	1.94	1.94	—	—
	$N_{R,k}$ in [kN]	0.40	1.42	1.42	1.42	1.42	1.42	1.42	1.42	—	—
		0.50	2.60	2.60	2.60	2.60	2.60	2.60	2.60	—	—
		0.55	2.60	2.60	2.60	2.60	2.60	2.60	2.60	—	—
		0.63	2.92	2.92	3.61	3.61	3.61	3.61	3.61	—	—
		0.75	2.92	2.92	3.99	3.99	3.99	3.99	3.99	—	—
		0.88	2.92	2.92	3.99	3.99	3.99	3.99	3.99	—	—
		1.00	2.92	2.92	3.99	3.99	3.99	3.99	3.99	—	—
max. head displacement u depending on the sandwich panel thickness in [mm]		30	2	2	2	2	2	2	2	—	—
		40	2	2	2	2	2	2	2	—	—
		50	2	2	2	2	2	2	2	—	—
		60	5	5	5	5	5	5	5	—	—
		70	5	5	5	5	5	5	5	—	—
		80	5	5	5	5	5	5	5	—	—
		90	7	7	7	7	7	7	7	—	—
		100	7	7	7	7	7	7	7	—	—
		120	7	7	7	7	7	7	7	—	—
		≥ 140	7	7	7	7	7	7	7	—	—

Fastening screws for sandwich panels
OC 5.5/6.3xL, ON 5.5/6.3xL, OCS 5.5/6.3xL and ONS 5.5/6.3xL

Annex 7

Self-drilling screw ONS 5.5/6.3xL with hexagon head and sealing washer EPDM S16

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 BS 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 BS 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 BS EN 1993-1-3, section 8.3 (8) should be taken into account.

Fastening screws for sandwich panels	**Annex 8**
Determination of design values	

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