INSTYTUT TECHNIKI BUDOWLANEJ

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European Technical Assessment

ETA-16/0734 of 30/12/2024

General Part

Technical Assessment Body issuing the European Technical Assessment	Instytut Techniki Budowlanej
Trade name of the construction product	ESPS, ESTS
Product family to which the construction product belongs	Fastening screws for sandwich panels
Manufacturer	Van Roij Fasteners Europe B.V. (EUROFAST / EUROFAST GROUP) Indumastraat 18 5753 RJ Deurne Netherlands
Manufacturing plants	Van Roij Fasteners Europe B.V. plants
This European Technical Assessment contains	170 pages including 165 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 version replaces	ETA-16/0734 issued on 29/12/2020

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 ESPS and ESTS 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. Screws can be completed with linear steel washer ELW-Z or ELW-S or saddle washer ESW. For details see the Annexes 2 to 164.

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

Table 1

No.	Screw	Material	Annex
1	ESPS-6-Z	galvanized carbon steel with ≥ 12 µm of zinc coating	2 to 7
2	ESPS-6-P	galvanized carbon steel with PREMIUM coating	8 to 13
3	ESPS-6-SP	galvanized carbon steel with SUPER PREMIUM coating	14 to 19
4	ESPS-6-B	stainless steel (bi-metal)	20 to 25
5	ESPS-12-Z	galvanized carbon steel with ≥ 12 µm of zinc coating	26 to 31
6	ESPS-12-P	galvanized carbon steel with PREMIUM coating	32 to 37
7	ESPS-12-SP	galvanized carbon steel with SUPER PREMIUM coating	38 to 43
8	ESPS-12-B	stainless steel (bi-metal)	44 to 49
9	ESPS-16-Z	galvanized carbon steel with ≥ 12 µm of zinc coating	50 to 55
10	ESPS-16-P	galvanized carbon steel with PREMIUM coating	56 to 61
11	ESPS-16-SP	galvanized carbon steel with SUPER PREMIUM coating	62 to 67
12	ESPS-20-Z	galvanized carbon steel with ≥ 12 µm of zinc coating	68 to 73
13	ESPS-20-P	galvanized carbon steel with PREMIUM coating	74 to 79
14	ESPS-20-SP	galvanized carbon steel with SUPER PREMIUM coating	80 to 85
15	ESPS-20S-Z	galvanized carbon steel with ≥ 12 µm of zinc coating	86 to 91
16	ESPS-20S-P	galvanized carbon steel with PREMIUM coating	92 to 97
17	ESPS-20S-SP	galvanized carbon steel with SUPER PREMIUM coating	98 to 103
18	ESPS-25-Z	galvanized carbon steel with ≥ 12 µm of zinc coating	104 to 109
19	ESPS-25-P	galvanized carbon steel with PREMIUM coating	110 to 115
20	ESPS-25-SP	galvanized carbon steel with SUPER PREMIUM coating	116 to 121
21	ESPS-CS2-Z	galvanized carbon steel with ≥ 12 µm of zinc coating	122 to 127
22	ESPS-CS2-P	galvanized carbon steel with PREMIUM coating	128 to 133
23	ESPS-CS2-SP	galvanized carbon steel with SUPER PREMIUM coating	134 to 139
24	ESTS-0A-Z / ESTS-HWH10-0A-Z	galvanized carbon steel with ≥ 12 µm of zinc coating	140 to 145
25	ESTS-0A-S / ESTS-HWH10-0A-S	galvanized stainless steel	146 to 151
26	ESTS-0B-Z / ESTS-HWH10-0B-Z	galvanized carbon steel with ≥ 12 µm of zinc coating	152 to 157
27	ESTS-0B-S / ESTS-HWH10-0B-S	galvanized stainless steel	158 to 163

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 163. The component

to be fastened is component I and the supporting structure is component II. The sandwich panel can either be used as wall or roof cladding or as load bearing wall and roof element.

The intended use comprises fastening screws and connections for indoor and outdoor applications. Fastening screws which are intended to be used in external environments with ≥ 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 given in this European Technical Assessment are based on an assumed working life of the screws of 25 years. The indications given on the working life cannot be interpreted as a guarantee given by the producer or the 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 2 to 163. The values were determined by tests according to EAD 330047-01-0602.

The design values shall be determined according to Annex 165 and EAD 330047-01-0602. For the corrosion protection the rules given in EN 1993-1-3 and EN 1993-1-4 shall be taken into account.

3.1.2 Safety in case of fire (BWR 2)

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

3.2 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 EC 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.

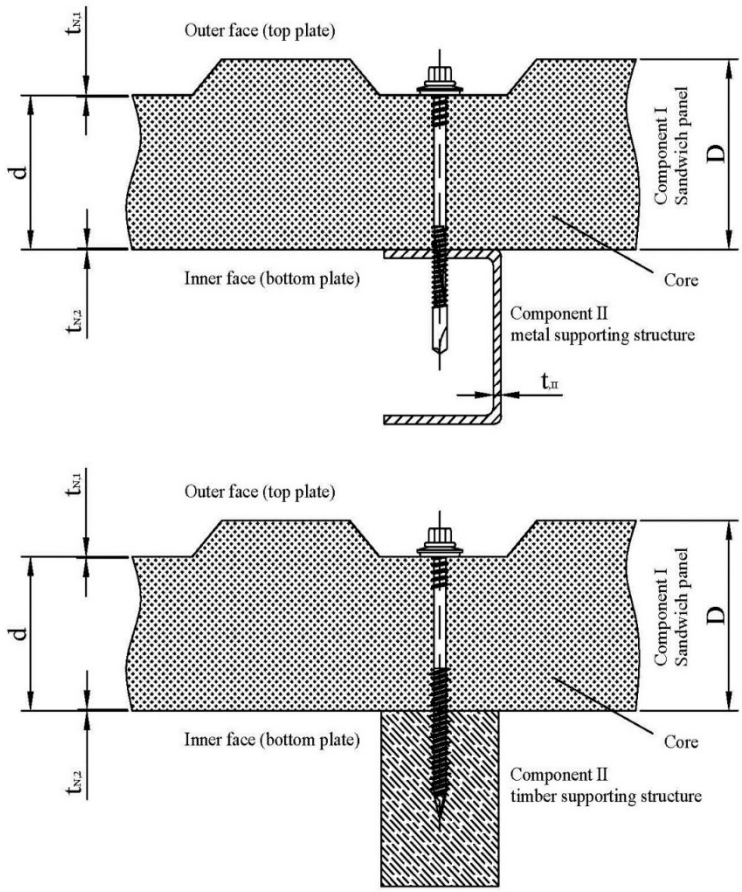
For type testing the results of the tests performed as part of the assessment for the European Technical Assessment shall be used unless there are changes in the production line or plant.

In such cases the necessary type testing has to be agreed between Instytut Techniki Budowlanej and the notified body.

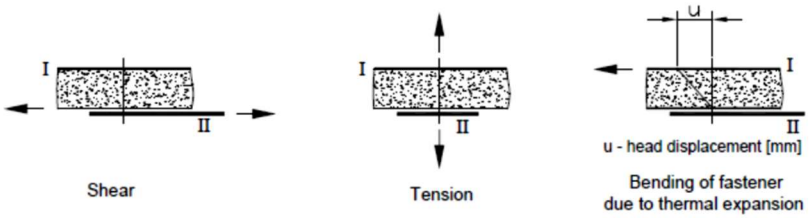
Issued in Warsaw on 30/12/2024 by Instytut Techniki Budowlanej

Anna Panek, MSc
Deputy Director of ITB

Examples of execution of a connections



Loading conditions



Fastening screws for sandwich panels	Annex 1 of European Technical Assessment ETA-16/0734
Example of execution of a connections. Loading conditions	

Materials

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

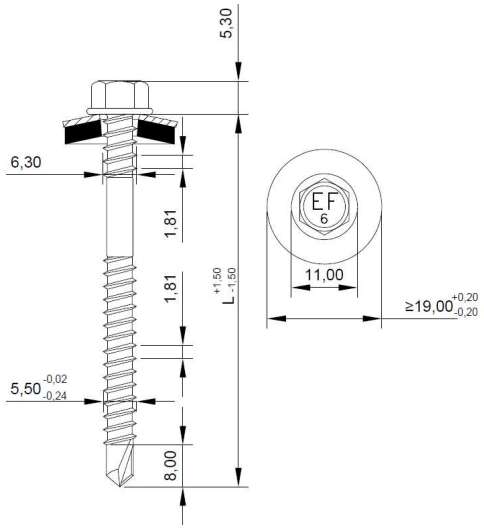
Washer: Z19, Z22, Z25, Z29 – carbon steel washer with EPDM ring

Component I: S280GD, S320GD or S350GD – EN 10346

Component II: S235 to S355 – EN 10025-1
S280GD, S320GD or S350GD – EN 10346

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

Timber substructures
no performance assessed



$t_{N,II}$ [mm]		2.00	2.50	3.00	4.00	5.00
$V_{R,k}$ [kN] for $t_{N,I}$ [mm]	0.40	0.84	0.84	0.84	0.84	0.84
	0.50	1.72	1.72	1.72	1.72	1.72
	0.55	1.72	1.72	1.72	1.72	1.72
	0.60	1.72	1.72	1.72	1.72	1.72
	0.63	1.90	1.90	1.90	1.90	1.90
	0.70	1.99	1.99	1.99	1.99	1.99
	0.75	2.69	2.69	2.69	2.69	2.69
	0.88	2.69	2.69	2.69	2.69	2.69
	1.00	3.10	3.10	3.10	3.10	3.10
$N_{R,k}$ [kN] for $t_{N,I}$ [mm]	0.40	1.81	1.81	1.81	1.81	1.81
	0.50	3.10	3.10	4.10	4.14	4.14
	0.55	3.10	3.10	4.10	4.14	4.14
	0.60	3.10	3.10	4.10	4.14	4.14
	0.63	3.10	3.10	4.10	5.10	5.10
	0.70	3.10	3.10	4.10	5.50	5.50
	0.75	3.10	3.10	4.10	7.70	7.70
	0.88	3.10	3.10	4.10	7.70	7.70
	1.00	3.10	3.10	4.10	7.78	7.78
$N_{R\ II,k}$ [kN]		3.10	3.10	4.10	8.07	8.07
max. head displacement "u" depending on sandwich panel thickness [mm]	30	0.7	0.7	0.7	0.7	0.7
	40	0.9	0.9	0.9	0.9	0.9
	50	1.2	1.2	1.2	1.2	1.2
	60	1.4	1.4	1.4	1.4	1.4
	70	1.6	1.6	1.6	1.6	1.6
	80	1.8	1.8	1.8	1.8	1.8
	90	2.1	2.1	2.1	2.1	2.1
	100	2.3	2.3	2.3	2.3	2.3
	110	2.5	2.5	2.5	2.5	2.5
	120	2.8	2.8	2.8	2.8	2.8
	130	3.0	3.0	3.0	3.0	3.0
	≥140	3.2	3.2	3.2	3.2	3.2

Fastening screws for sandwich panels

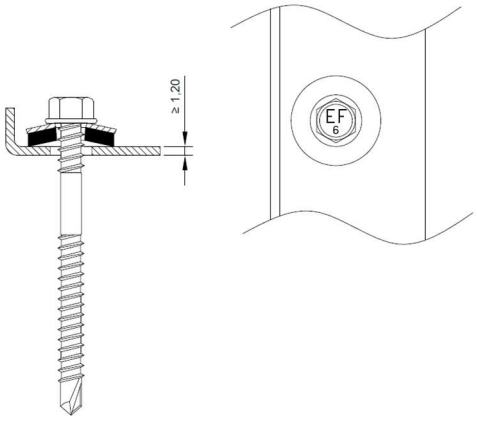
Self-drilling screws ESPS-6-Z 6,3/5,5xL with hexagon head and washer Z19, Z22, Z25 or Z29

Annex 2

of European Technical Assessment ETA-16/0734

Materials

Fastener:	carbon steel – SAE1022, quenched, tempered and coated: galvanized (12 µm)
Washer:	Z19, Z22, Z25, Z29 – carbon steel washer with EPDM ring
Linear washer:	ELW-Z made of carbon steel – $R_{0,2} \geq 200$ MPa and galvanized min. 200 g/m² ELW-S made of stainless steel A2 – EN ISO 3506
Component I:	S280GD, S320GD or S350GD – EN 10346
Component II:	S235 to S355 – EN 10025-1 S280GD, S320GD or S350GD – EN 10346



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

Timber substructures
no performance assessed

$t_{N,II}$ [mm]		2.00	2.50	3.00	4.00	5.00
$V_{R,k}$ [kN] for $t_{N,I}$ [mm]	0.40	0.84	0.84	0.84	0.84	0.84
	0.50	1.72	1.72	1.72	1.72	1.72
	0.55	1.72	1.72	1.72	1.72	1.72
	0.60	1.72	1.72	1.72	1.72	1.72
	0.63	1.72	1.72	1.72	1.72	1.72
	0.70	1.99	1.99	1.99	1.99	1.99
	0.75	2.69	2.69	2.69	2.69	2.69
	0.88	2.69	2.69	2.69	2.69	2.69
	1.00	3.10	3.10	3.10	3.10	3.10
$N_{R,k}$ [kN] for $t_{N,I}$ [mm]	0.40	3.10	3.10	4.10	7.78	7.78
	0.50	3.10	3.10	4.10	7.78	7.78
	0.55	3.10	3.10	4.10	7.78	7.78
	0.60	3.10	3.10	4.10	7.78	7.78
	0.63	3.10	3.10	4.10	7.78	7.78
	0.70	3.10	3.10	4.10	7.78	7.78
	0.75	3.10	3.10	4.10	7.78	7.78
	0.88	3.10	3.10	4.10	7.78	7.78
	1.00	3.10	3.10	4.10	7.78	7.78
$N_{R\,II,k}$ [kN]		3.10	3.10	4.10	8.07	8.07
max. head displacement "u" depending on sandwich panel thickness [mm]	30	0.7	0.7	0.7	0.7	0.7
	40	0.9	0.9	0.9	0.9	0.9
	50	1.2	1.2	1.2	1.2	1.2
	60	1.4	1.4	1.4	1.4	1.4
	70	1.6	1.6	1.6	1.6	1.6
	80	1.8	1.8	1.8	1.8	1.8
	90	2.1	2.1	2.1	2.1	2.1
	100	2.3	2.3	2.3	2.3	2.3
	110	2.5	2.5	2.5	2.5	2.5
	120	2.8	2.8	2.8	2.8	2.8
	130	3.0	3.0	3.0	3.0	3.0
	≥140	3.2	3.2	3.2	3.2	3.2

Fastening screws for sandwich panels

Self-drilling screws ESPS-6-Z 6,3/5,5xL with hexagon head, washer Z19, Z22, Z25 or Z29 and linear washer ELW-Z or ELW-S

Annex 3

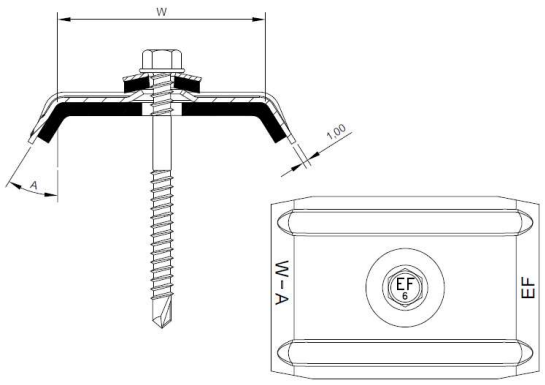
of European Technical Assessment ETA-16/0734

Materials

Fastener:	carbon steel – SAE1022, quenched, tempered and coated: galvanized (12 µm)
Washer:	Z19, Z22, Z25, Z29 – carbon steel washer with EPDM ring
Saddle washer:	ESW made of aluminum
Component I:	S280GD, S320GD or S350GD – EN 10346
Component II:	S235 to S355 – EN 10025-1 S280GD, S320GD or S350GD – EN 10346

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

Timber substructures
no performance assessed



$t_{N,II}$ [mm]		2.00	2.50	3.00	4.00	5.00
$V_{R,k}$ [kN] for $t_{N,I}$ [mm]	0.40	0.84	0.84	0.84	0.84	0.84
	0.50	1.72	1.72	1.72	1.72	1.72
	0.55	1.72	1.72	1.72	1.72	1.72
	0.60	1.72	1.72	1.72	1.72	1.72
	0.63	1.90	1.90	1.90	1.90	1.90
	0.70	1.99	1.99	1.99	1.99	1.99
	0.75	2.69	2.69	2.69	2.69	2.69
	0.88	2.69	2.69	2.69	2.69	2.69
	1.00	3.10	3.10	3.10	3.10	3.10
$N_{R,k}$ [kN] for $t_{N,I}$ [mm]	0.40	3.10	3.10	4.10	8.07	8.07
	0.50	3.10	3.10	4.10	8.07	8.07
	0.55	3.10	3.10	4.10	8.07	8.07
	0.60	3.10	3.10	4.10	8.07	8.07
	0.63	3.10	3.10	4.10	8.07	8.07
	0.70	3.10	3.10	4.10	8.07	8.07
	0.75	3.10	3.10	4.10	8.07	8.07
	0.88	3.10	3.10	4.10	8.07	8.07
	1.00	3.10	3.10	4.10	8.07	8.07
$N_{R\ II,k}$ [kN]		3.10	3.10	4.10	8.07	8.07
max. head displacement "u" depending on sandwich panel thickness [mm]	30	0.7	0.7	0.7	0.7	0.7
	40	0.9	0.9	0.9	0.9	0.9
	50	1.2	1.2	1.2	1.2	1.2
	60	1.4	1.4	1.4	1.4	1.4
	70	1.6	1.6	1.6	1.6	1.6
	80	1.8	1.8	1.8	1.8	1.8
	90	2.1	2.1	2.1	2.1	2.1
	100	2.3	2.3	2.3	2.3	2.3
	110	2.5	2.5	2.5	2.5	2.5
	120	2.8	2.8	2.8	2.8	2.8
	130	3.0	3.0	3.0	3.0	3.0
	≥140	3.2	3.2	3.2	3.2	3.2

Fastening screws for sandwich panels

Self-drilling screws ESPS-6-Z 6,3/5,5xL with hexagon head, washer Z19, Z22, Z25 or Z29 and saddle washer ESW

Annex 4

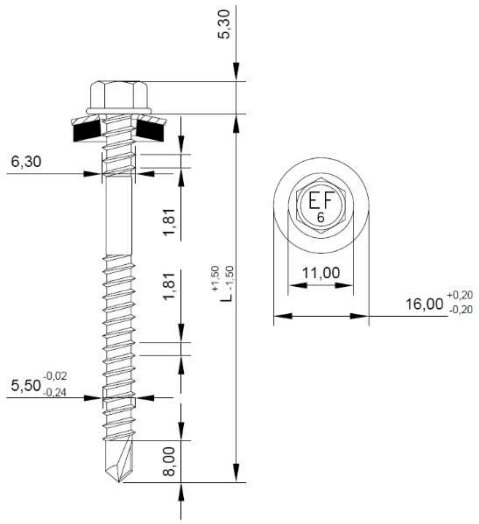
of European Technical Assessment ETA-16/0734

Materials

Fastener:	carbon steel – SAE1022, quenched, tempered and coated: galvanized (12 µm)
Washer:	Z16 – carbon steel washer with EPDM ring
Component I:	S280GD, S320GD or S350GD – EN 10346
Component II:	S235 to S355 – EN 10025-1 S280GD, S320GD or S350GD – EN 10346

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

Timber substructures
no performance assessed



$t_{N,II}$ [mm]		2.00	2.50	3.00	4.00	5.00
$V_{R,k}$ [kN] for $t_{N,I}$ [mm]	0.40	0.84	0.84	0.84	0.84	0.84
	0.50	1.72	1.72	1.72	1.72	1.72
	0.55	1.72	1.72	1.72	1.72	1.72
	0.60	1.72	1.72	1.72	1.72	1.72
	0.63	1.90	1.90	1.90	1.90	1.90
	0.70	1.99	1.99	1.99	1.99	1.99
	0.75	2.69	2.69	2.69	2.69	2.69
	0.88	2.69	2.69	2.69	2.69	2.69
	1.00	3.10	3.10	3.10	3.10	3.10
$N_{R,k}$ [kN] for $t_{N,I}$ [mm]	0.40	1.40	1.40	1.40	1.40	1.40
	0.50	2.53	2.53	2.53	2.53	2.53
	0.55	2.53	2.53	2.53	2.53	2.53
	0.60	2.77	2.77	2.77	2.77	2.77
	0.63	2.77	2.77	2.77	2.77	2.77
	0.70	2.89	2.89	2.89	2.89	2.89
	0.75	2.89	2.89	2.89	2.89	2.89
	0.88	2.89	2.89	2.89	2.89	2.89
	1.00	3.10	3.10	4.10	4.27	4.27
$N_{R\ II,k}$ [kN]		3.10	3.10	4.10	8.07	8.07
max. head displacement "u" depending on sandwich panel thickness [mm]	30	0.7	0.7	0.7	0.7	0.7
	40	0.9	0.9	0.9	0.9	0.9
	50	1.2	1.2	1.2	1.2	1.2
	60	1.4	1.4	1.4	1.4	1.4
	70	1.6	1.6	1.6	1.6	1.6
	80	1.8	1.8	1.8	1.8	1.8
	90	2.1	2.1	2.1	2.1	2.1
	100	2.3	2.3	2.3	2.3	2.3
	110	2.5	2.5	2.5	2.5	2.5
	120	2.8	2.8	2.8	2.8	2.8
	130	3.0	3.0	3.0	3.0	3.0
	≥140	3.2	3.2	3.2	3.2	3.2

Fastening screws for sandwich panels

Self-drilling screws ESPS-6-Z 6,3/5,5xL with hexagon head and washer Z16

Annex 5

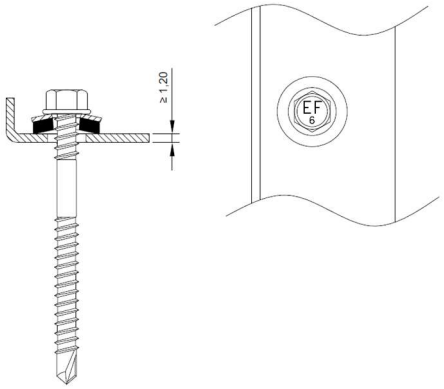
of European Technical Assessment ETA-16/0734

Materials

Fastener:	carbon steel – SAE1022, quenched, tempered and coated: galvanized (12 µm)
Washer:	Z16 – carbon steel washer with EPDM ring
Linear washer:	ELW-Z made of carbon steel – $R_{0,2} \geq 200$ MPa and galvanized min. 200 g/m² ELW-S made of stainless steel A2 – EN ISO 3506
Component I:	S280GD, S320GD or S350GD – EN 10346
Component II:	S235 to S355 – EN 10025-1 S280GD, S320GD or S350GD – EN 10346

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

Timber substructures
no performance assessed



$t_{N,II}$ [mm]		2.00	2.50	3.00	4.00	5.00
$V_{R,k}$ [kN] for $t_{N,I}$ [mm]	0.40	0.84	0.84	0.84	0.84	0.84
	0.50	1.72	1.72	1.72	1.72	1.72
	0.55	1.72	1.72	1.72	1.72	1.72
	0.60	1.72	1.72	1.72	1.72	1.72
	0.63	1.90	1.90	1.90	1.90	1.90
	0.70	1.99	1.99	1.99	1.99	1.99
	0.75	2.69	2.69	2.69	2.69	2.69
	0.88	2.69	2.69	2.69	2.69	2.69
	1.00	3.10	3.10	3.10	3.10	3.10
$N_{R,k}$ [kN] for $t_{N,I}$ [mm]	0.40	3.10	3.10	4.10	8.07	8.07
	0.50	3.10	3.10	4.10	8.07	8.07
	0.55	3.10	3.10	4.10	8.07	8.07
	0.60	3.10	3.10	4.10	8.07	8.07
	0.63	3.10	3.10	4.10	8.07	8.07
	0.70	3.10	3.10	4.10	8.07	8.07
	0.75	3.10	3.10	4.10	8.07	8.07
	0.88	3.10	3.10	4.10	8.07	8.07
	1.00	3.10	3.10	4.10	8.07	8.07
$N_{R\ II,k}$ [kN]		3.10	3.10	4.10	8.07	8.07
max. head displacement "u" depending on sandwich panel thickness [mm]	30	0.7	0.7	0.7	0.7	0.7
	40	0.9	0.9	0.9	0.9	0.9
	50	1.2	1.2	1.2	1.2	1.2
	60	1.4	1.4	1.4	1.4	1.4
	70	1.6	1.6	1.6	1.6	1.6
	80	1.8	1.8	1.8	1.8	1.8
	90	2.1	2.1	2.1	2.1	2.1
	100	2.3	2.3	2.3	2.3	2.3
	110	2.5	2.5	2.5	2.5	2.5
	120	2.8	2.8	2.8	2.8	2.8
	130	3.0	3.0	3.0	3.0	3.0
	≥140	3.2	3.2	3.2	3.2	3.2

Fastening screws for sandwich panels

Self-drilling screws ESPS-6-Z 6,3/5,5xL with hexagon head, washer Z16 and linear washer ELW-Z or ELW-S

Annex 6

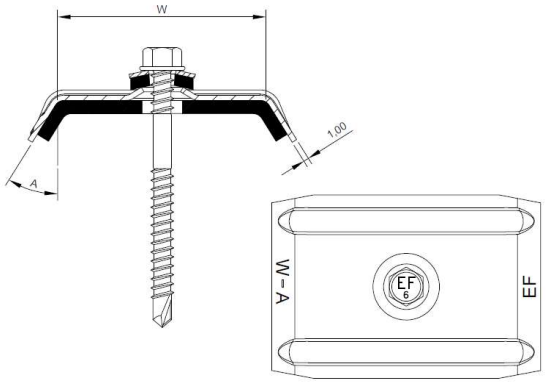
of European Technical Assessment ETA-16/0734

Materials

Fastener:	carbon steel – SAE1022, quenched, tempered and coated: galvanized (12 µm)
Washer:	Z16 – carbon steel washer with EPDM ring
Saddle washer:	ESW made of aluminum
Component I:	S280GD, S320GD or S350GD – EN 10346
Component II:	S235 to S355 – EN 10025-1 S280GD, S320GD or S350GD – EN 10346

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

Timber substructures
no performance assessed



$t_{N,II}$ [mm]		2.00	2.50	3.00	4.00	5.00
$V_{R,k}$ [kN] for $t_{N,I}$ [mm]	0.40	0.84	0.84	0.84	0.84	0.84
	0.50	1.72	1.72	1.72	1.72	1.72
	0.55	1.72	1.72	1.72	1.72	1.72
	0.60	1.72	1.72	1.72	1.72	1.72
	0.63	1.90	1.90	1.90	1.90	1.90
	0.70	1.99	1.99	1.99	1.99	1.99
	0.75	2.69	2.69	2.69	2.69	2.69
	0.88	2.69	2.69	2.69	2.69	2.69
	1.00	3.10	3.10	3.10	3.10	3.10
$N_{R,k}$ [kN] for $t_{N,I}$ [mm]	0.40	3.10	3.10	4.10	8.07	8.07
	0.50	3.10	3.10	4.10	8.07	8.07
	0.55	3.10	3.10	4.10	8.07	8.07
	0.60	3.10	3.10	4.10	8.07	8.07
	0.63	3.10	3.10	4.10	8.07	8.07
	0.70	3.10	3.10	4.10	8.07	8.07
	0.75	3.10	3.10	4.10	8.07	8.07
	0.88	3.10	3.10	4.10	8.07	8.07
	1.00	3.10	3.10	4.10	8.07	8.07
$N_{R\ II,k}$ [kN]		3.10	3.10	4.10	8.07	8.07
max. head displacement "u" depending on sandwich panel thickness [mm]	30	0.7	0.7	0.7	0.7	0.7
	40	0.9	0.9	0.9	0.9	0.9
	50	1.2	1.2	1.2	1.2	1.2
	60	1.4	1.4	1.4	1.4	1.4
	70	1.6	1.6	1.6	1.6	1.6
	80	1.8	1.8	1.8	1.8	1.8
	90	2.1	2.1	2.1	2.1	2.1
	100	2.3	2.3	2.3	2.3	2.3
	110	2.5	2.5	2.5	2.5	2.5
	120	2.8	2.8	2.8	2.8	2.8
	130	3.0	3.0	3.0	3.0	3.0
	≥140	3.2	3.2	3.2	3.2	3.2

Fastening screws for sandwich panels

Self-drilling screws ESPS-6-Z 6,3/5,5xL with hexagon head, washer Z16 and saddle washer ESW

Annex 7

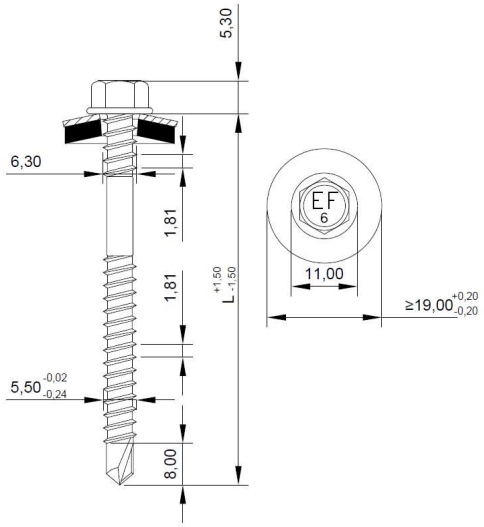
of European Technical Assessment ETA-16/0734

Materials

Fastener:	carbon steel – SAE1022, quenched, tempered and coated: galvanized with PREMIUM coating
Washer:	A19, A22, A25, A29 – aluminum washer with EPDM ring
Component I:	S280GD, S320GD or S350GD – EN 10346
Component II:	S235 to S355 – EN 10025-1 S280GD, S320GD or S350GD – EN 10346

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

Timber substructures
no performance assessed



$t_{N,II}$ [mm]		2.00	2.50	3.00	4.00	5.00
$V_{R,k}$ [kN] for $t_{N,I}$ [mm]	0.40	0.84	0.84	0.84	0.84	0.84
	0.50	1.72	1.72	1.72	1.72	1.72
	0.55	1.72	1.72	1.72	1.72	1.72
	0.60	1.72	1.72	1.72	1.72	1.72
	0.63	1.90	1.90	1.90	1.90	1.90
	0.70	1.99	1.99	1.99	1.99	1.99
	0.75	2.69	2.69	2.69	2.69	2.69
	0.88	2.69	2.69	2.69	2.69	2.69
	1.00	3.10	3.10	3.10	3.10	3.10
$N_{R,k}$ [kN] for $t_{N,I}$ [mm]	0.40	1.81	1.81	1.81	1.81	1.81
	0.50	3.10	3.10	4.10	4.14	4.14
	0.55	3.10	3.10	4.10	4.14	4.14
	0.60	3.10	3.10	4.10	4.14	4.14
	0.63	3.10	3.10	4.10	5.10	5.10
	0.70	3.10	3.10	4.10	5.50	5.50
	0.75	3.10	3.10	4.10	7.70	7.70
	0.88	3.10	3.10	4.10	7.70	7.70
	1.00	3.10	3.10	4.10	7.78	7.78
$N_{R\ II,k}$ [kN]		3.10	3.10	4.10	8.07	8.07
max. head displacement "u" depending on sandwich panel thickness [mm]	30	0.7	0.7	0.7	0.7	0.7
	40	0.9	0.9	0.9	0.9	0.9
	50	1.2	1.2	1.2	1.2	1.2
	60	1.4	1.4	1.4	1.4	1.4
	70	1.6	1.6	1.6	1.6	1.6
	80	1.8	1.8	1.8	1.8	1.8
	90	2.1	2.1	2.1	2.1	2.1
	100	2.3	2.3	2.3	2.3	2.3
	110	2.5	2.5	2.5	2.5	2.5
	120	2.8	2.8	2.8	2.8	2.8
	130	3.0	3.0	3.0	3.0	3.0
	≥140	3.2	3.2	3.2	3.2	3.2

Fastening screws for sandwich panels

Self-drilling screws ESPS-6-P 6,3/5,5xL with hexagon head and washer A19, A22, A25 or A29

Annex 8

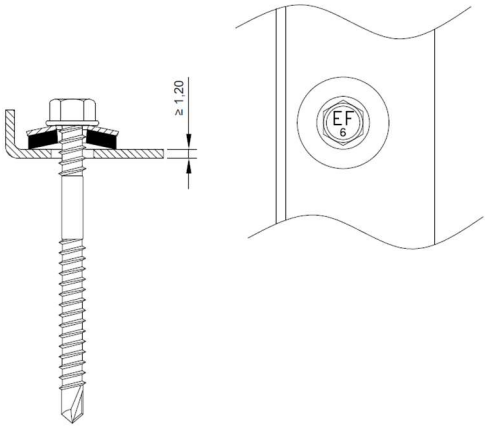
of European Technical Assessment ETA-16/0734

Materials

Fastener:	carbon steel – SAE1022, quenched, tempered and coated: galvanized with PREMIUM coating
Washer:	A19, A22, A25, A29 – aluminum washer with EPDM ring
Linear washer:	ELW-Z made of carbon steel – $R_{0,2} \geq 200$ MPa and galvanized min. 200 g/m^2 ELW-S made of stainless steel A2 – EN ISO 3506
Component I:	S280GD, S320GD or S350GD – EN 10346
Component II:	S235 to S355 – EN 10025-1 S280GD, S320GD or S350GD – EN 10346

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

Timber substructures
no performance assessed



$t_{N,II}$ [mm]		2.00	2.50	3.00	4.00	5.00
$V_{R,k}$ [kN] for $t_{N,I}$ [mm]	0.40	0.84	0.84	0.84	0.84	0.84
	0.50	1.72	1.72	1.72	1.72	1.72
	0.55	1.72	1.72	1.72	1.72	1.72
	0.60	1.72	1.72	1.72	1.72	1.72
	0.63	1.90	1.90	1.90	1.90	1.90
	0.70	1.99	1.99	1.99	1.99	1.99
	0.75	2.69	2.69	2.69	2.69	2.69
	0.88	2.69	2.69	2.69	2.69	2.69
	1.00	3.10	3.10	3.10	3.10	3.10
$N_{R,k}$ [kN] for $t_{N,I}$ [mm]	0.40	3.10	3.10	4.10	7.78	7.78
	0.50	3.10	3.10	4.10	7.78	7.78
	0.55	3.10	3.10	4.10	7.78	7.78
	0.60	3.10	3.10	4.10	7.78	7.78
	0.63	3.10	3.10	4.10	7.78	7.78
	0.70	3.10	3.10	4.10	7.78	7.78
	0.75	3.10	3.10	4.10	7.78	7.78
	0.88	3.10	3.10	4.10	7.78	7.78
	1.00	3.10	3.10	4.10	7.78	7.78
$N_{R\ II,k}$ [kN]		3.10	3.10	4.10	8.07	8.07
max. head displacement "u" depending on sandwich panel thickness [mm]	30	0.7	0.7	0.7	0.7	0.7
	40	0.9	0.9	0.9	0.9	0.9
	50	1.2	1.2	1.2	1.2	1.2
	60	1.4	1.4	1.4	1.4	1.4
	70	1.6	1.6	1.6	1.6	1.6
	80	1.8	1.8	1.8	1.8	1.8
	90	2.1	2.1	2.1	2.1	2.1
	100	2.3	2.3	2.3	2.3	2.3
	110	2.5	2.5	2.5	2.5	2.5
	120	2.8	2.8	2.8	2.8	2.8
	130	3.0	3.0	3.0	3.0	3.0
	≥140	3.2	3.2	3.2	3.2	3.2

Fastening screws for sandwich panels

Self-drilling screws ESPS-6-P 6,3/5,5xL with hexagon head, washer A19, A22, A25 or A29 and linear washer ELW-Z or ELW-S

Annex 9

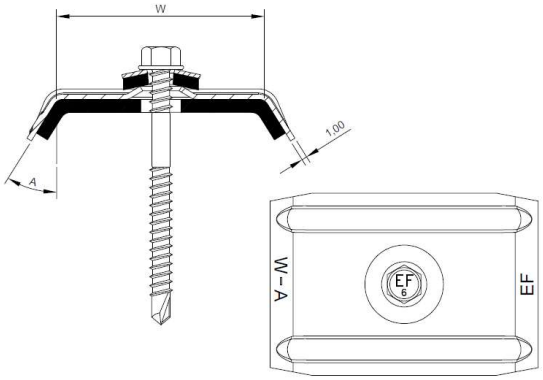
of European Technical Assessment ETA-16/0734

Materials

Fastener:	carbon steel – SAE1022, quenched, tempered and coated: galvanized with PREMIUM coating
Washer:	A19, A22, A25, A29 – aluminum washer with EPDM ring
Saddle washer:	ESW made of aluminum
Component I:	S280GD, S320GD or S350GD – EN 10346
Component II:	S235 to S355 – EN 10025-1 S280GD, S320GD or S350GD – EN 10346

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

Timber substructures
no performance assessed



$t_{N,II}$ [mm]		2.00	2.50	3.00	4.00	5.00
$V_{R,k}$ [kN] for $t_{N,I}$ [mm]	0.40	0.84	0.84	0.84	0.84	0.84
	0.50	1.72	1.72	1.72	1.72	1.72
	0.55	1.72	1.72	1.72	1.72	1.72
	0.60	1.72	1.72	1.72	1.72	1.72
	0.63	1.90	1.90	1.90	1.90	1.90
	0.70	1.99	1.99	1.99	1.99	1.99
	0.75	2.69	2.69	2.69	2.69	2.69
	0.88	2.69	2.69	2.69	2.69	2.69
	1.00	3.10	3.10	3.10	3.10	3.10
$N_{R,k}$ [kN] for $t_{N,I}$ [mm]	0.40	3.10	3.10	4.10	8.07	8.07
	0.50	3.10	3.10	4.10	8.07	8.07
	0.55	3.10	3.10	4.10	8.07	8.07
	0.60	3.10	3.10	4.10	8.07	8.07
	0.63	3.10	3.10	4.10	8.07	8.07
	0.70	3.10	3.10	4.10	8.07	8.07
	0.75	3.10	3.10	4.10	8.07	8.07
	0.88	3.10	3.10	4.10	8.07	8.07
	1.00	3.10	3.10	4.10	8.07	8.07
$N_{R\ II,k}$ [kN]		3.10	3.10	4.10	8.07	8.07
max. head displacement "u" depending on sandwich panel thickness [mm]	30	0.7	0.7	0.7	0.7	0.7
	40	0.9	0.9	0.9	0.9	0.9
	50	1.2	1.2	1.2	1.2	1.2
	60	1.4	1.4	1.4	1.4	1.4
	70	1.6	1.6	1.6	1.6	1.6
	80	1.8	1.8	1.8	1.8	1.8
	90	2.1	2.1	2.1	2.1	2.1
	100	2.3	2.3	2.3	2.3	2.3
	110	2.5	2.5	2.5	2.5	2.5
	120	2.8	2.8	2.8	2.8	2.8
	130	3.0	3.0	3.0	3.0	3.0
	≥140	3.2	3.2	3.2	3.2	3.2

Fastening screws for sandwich panels

Self-drilling screws ESPS-6-P 6,3/5,5xL with hexagon head, washer A19, A22, A25 or A29 and saddle washer ESW

Annex 10

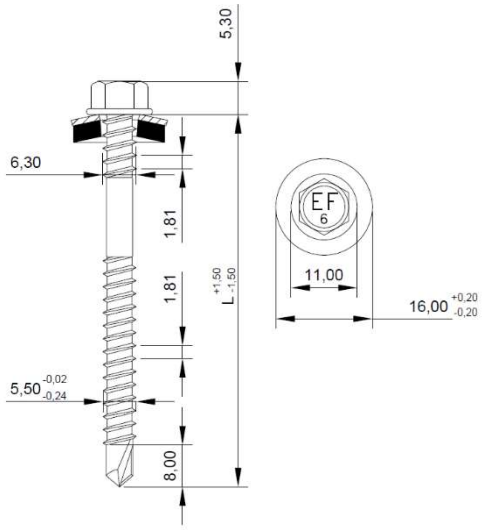
of European Technical Assessment ETA-16/0734

Materials

Fastener:	carbon steel – SAE1022, quenched, tempered and coated: galvanized with PREMIUM coating
Washer:	A16 – aluminum washer with EPDM ring
Component I:	S280GD, S320GD or S350GD – EN 10346
Component II:	S235 to S355 – EN 10025-1 S280GD, S320GD or S350GD – EN 10346

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

Timber substructures
no performance assessed



$t_{N,II}$ [mm]		2.00	2.50	3.00	4.00	5.00
$V_{R,k}$ [kN] for $t_{N,I}$ [mm]	0.40	0.84	0.84	0.84	0.84	0.84
	0.50	1.72	1.72	1.72	1.72	1.72
	0.55	1.72	1.72	1.72	1.72	1.72
	0.60	1.72	1.72	1.72	1.72	1.72
	0.63	1.90	1.90	1.90	1.90	1.90
	0.70	1.99	1.99	1.99	1.99	1.99
	0.75	2.69	2.69	2.69	2.69	2.69
	0.88	2.69	2.69	2.69	2.69	2.69
	1.00	3.10	3.10	3.10	3.10	3.10
$N_{R,k}$ [kN] for $t_{N,I}$ [mm]	0.40	1.40	1.40	1.40	1.40	1.40
	0.50	2.53	2.53	2.53	2.53	2.53
	0.55	2.53	2.53	2.53	2.53	2.53
	0.60	2.77	2.77	2.77	2.77	2.77
	0.63	2.77	2.77	2.77	2.77	2.77
	0.70	2.89	2.89	2.89	2.89	2.89
	0.75	2.89	2.89	2.89	2.89	2.89
	0.88	2.89	2.89	2.89	2.89	2.89
	1.00	3.10	3.10	4.10	4.27	4.27
$N_{R\ II,k}$ [kN]		3.10	3.10	4.10	8.07	8.07
max. head displacement "u" depending on sandwich panel thickness [mm]	30	0.7	0.7	0.7	0.7	0.7
	40	0.9	0.9	0.9	0.9	0.9
	50	1.2	1.2	1.2	1.2	1.2
	60	1.4	1.4	1.4	1.4	1.4
	70	1.6	1.6	1.6	1.6	1.6
	80	1.8	1.8	1.8	1.8	1.8
	90	2.1	2.1	2.1	2.1	2.1
	100	2.3	2.3	2.3	2.3	2.3
	110	2.5	2.5	2.5	2.5	2.5
	120	2.8	2.8	2.8	2.8	2.8
	130	3.0	3.0	3.0	3.0	3.0
	≥140	3.2	3.2	3.2	3.2	3.2

Fastening screws for sandwich panels

Self-drilling screws ESPS-6-P 6,3/5,5xL with hexagon head and washer A16

Annex 11

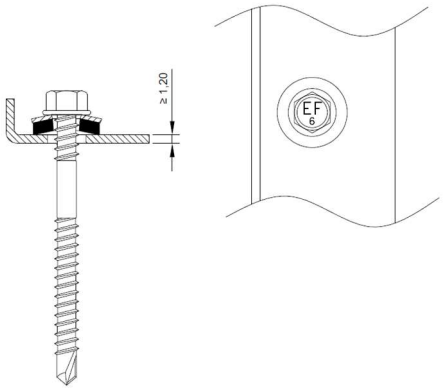
of European Technical Assessment ETA-16/0734

Materials

Fastener:	carbon steel – SAE1022, quenched, tempered and coated: galvanized with PREMIUM coating
Washer:	A16 – aluminum washer with EPDM ring
Linear washer:	ELW-Z made of carbon steel – $R_{0,2} \geq 200$ MPa and galvanized min. 200 g/m^2 ELW-S made of stainless steel A2 – EN ISO 3506
Component I:	S280GD, S320GD or S350GD – EN 10346
Component II:	S235 to S355 – EN 10025-1 S280GD, S320GD or S350GD – EN 10346

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

Timber substructures
no performance assessed



$t_{N,II}$ [mm]		2.00	2.50	3.00	4.00	5.00
$V_{R,k}$ [kN] for $t_{N,I}$ [mm]	0.40	0.84	0.84	0.84	0.84	0.84
	0.50	1.72	1.72	1.72	1.72	1.72
	0.55	1.72	1.72	1.72	1.72	1.72
	0.60	1.72	1.72	1.72	1.72	1.72
	0.63	1.90	1.90	1.90	1.90	1.90
	0.70	1.99	1.99	1.99	1.99	1.99
	0.75	2.69	2.69	2.69	2.69	2.69
	0.88	2.69	2.69	2.69	2.69	2.69
	1.00	3.10	3.10	3.10	3.10	3.10
$N_{R,k}$ [kN] for $t_{N,I}$ [mm]	0.40	3.10	3.10	4.10	8.07	8.07
	0.50	3.10	3.10	4.10	8.07	8.07
	0.55	3.10	3.10	4.10	8.07	8.07
	0.60	3.10	3.10	4.10	8.07	8.07
	0.63	3.10	3.10	4.10	8.07	8.07
	0.70	3.10	3.10	4.10	8.07	8.07
	0.75	3.10	3.10	4.10	8.07	8.07
	0.88	3.10	3.10	4.10	8.07	8.07
	1.00	3.10	3.10	4.10	8.07	8.07
$N_{R\ II,k}$ [kN]		3.10	3.10	4.10	8.07	8.07
max. head displacement "u" depending on sandwich panel thickness [mm]	30	0.7	0.7	0.7	0.7	0.7
	40	0.9	0.9	0.9	0.9	0.9
	50	1.2	1.2	1.2	1.2	1.2
	60	1.4	1.4	1.4	1.4	1.4
	70	1.6	1.6	1.6	1.6	1.6
	80	1.8	1.8	1.8	1.8	1.8
	90	2.1	2.1	2.1	2.1	2.1
	100	2.3	2.3	2.3	2.3	2.3
	110	2.5	2.5	2.5	2.5	2.5
	120	2.8	2.8	2.8	2.8	2.8
	130	3.0	3.0	3.0	3.0	3.0
	≥140	3.2	3.2	3.2	3.2	3.2

Fastening screws for sandwich panels

Self-drilling screws ESPS-6-P 6,3/5,5xL with hexagon head, washer A16 and linear washer ELW-Z or ELW-S

Annex 12

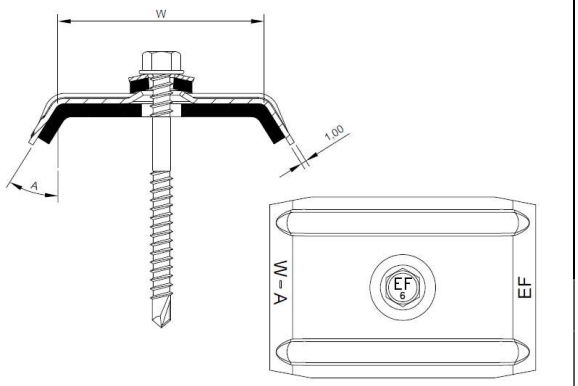
of European Technical Assessment ETA-16/0734

Materials

Fastener:	carbon steel – SAE1022, quenched, tempered and coated: galvanized with PREMIUM coating
Washer:	A16 – aluminum washer with EPDM ring
Saddle washer:	ESW made of aluminum
Component I:	S280GD, S320GD or S350GD – EN 10346
Component II:	S235 to S355 – EN 10025-1 S280GD, S320GD or S350GD – EN 10346

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

Timber substructures
no performance assessed



$t_{N,II}$ [mm]		2.00	2.50	3.00	4.00	5.00
$V_{R,k}$ [kN] for $t_{N,I}$ [mm]	0.40	0.84	0.84	0.84	0.84	0.84
	0.50	1.72	1.72	1.72	1.72	1.72
	0.55	1.72	1.72	1.72	1.72	1.72
	0.60	1.72	1.72	1.72	1.72	1.72
	0.63	1.90	1.90	1.90	1.90	1.90
	0.70	1.99	1.99	1.99	1.99	1.99
	0.75	2.69	2.69	2.69	2.69	2.69
	0.88	2.69	2.69	2.69	2.69	2.69
	1.00	3.10	3.10	3.10	3.10	3.10
$N_{R,k}$ [kN] for $t_{N,I}$ [mm]	0.40	3.10	3.10	4.10	8.07	8.07
	0.50	3.10	3.10	4.10	8.07	8.07
	0.55	3.10	3.10	4.10	8.07	8.07
	0.60	3.10	3.10	4.10	8.07	8.07
	0.63	3.10	3.10	4.10	8.07	8.07
	0.70	3.10	3.10	4.10	8.07	8.07
	0.75	3.10	3.10	4.10	8.07	8.07
	0.88	3.10	3.10	4.10	8.07	8.07
	1.00	3.10	3.10	4.10	8.07	8.07
$N_{R\ II,k}$ [kN]		3.10	3.10	4.10	8.07	8.07
max. head displacement "u" depending on sandwich panel thickness [mm]	30	0.7	0.7	0.7	0.7	0.7
	40	0.9	0.9	0.9	0.9	0.9
	50	1.2	1.2	1.2	1.2	1.2
	60	1.4	1.4	1.4	1.4	1.4
	70	1.6	1.6	1.6	1.6	1.6
	80	1.8	1.8	1.8	1.8	1.8
	90	2.1	2.1	2.1	2.1	2.1
	100	2.3	2.3	2.3	2.3	2.3
	110	2.5	2.5	2.5	2.5	2.5
	120	2.8	2.8	2.8	2.8	2.8
	130	3.0	3.0	3.0	3.0	3.0
	≥140	3.2	3.2	3.2	3.2	3.2

Fastening screws for sandwich panels

Self-drilling screws ESPS-6-P 6,3/5,5xL with hexagon head, washer A16 and saddle washer ESW

Annex 13

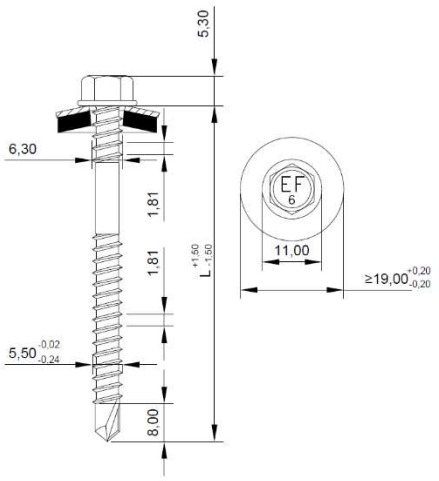
of European Technical Assessment ETA-16/0734

Materials

Fastener:	carbon steel – SAE1022, quenched, tempered and coated: galvanized with SUPER PREMIUM coating
Washer:	S19, S22, S25, S29 – stainless steel washer with EPDM ring or A19, A22, A25, A29 – aluminum washer with EPDM ring
Component I:	S280GD, S320GD or S350GD – EN 10346
Component II:	S235 to S355 – EN 10025-1 S280GD, S320GD or S350GD – EN 10346

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

Timber substructures
no performance assessed



$t_{N,II}$ [mm]		2.00	2.50	3.00	4.00	5.00
$V_{R,k}$ [kN] for $t_{N,I}$ [mm]	0.40	0.84	0.84	0.84	0.84	0.84
	0.50	1.72	1.72	1.72	1.72	1.72
	0.55	1.72	1.72	1.72	1.72	1.72
	0.60	1.72	1.72	1.72	1.72	1.72
	0.63	1.90	1.90	1.90	1.90	1.90
	0.70	1.99	1.99	1.99	1.99	1.99
	0.75	2.69	2.69	2.69	2.69	2.69
	0.88	2.69	2.69	2.69	2.69	2.69
	1.00	3.10	3.10	3.10	3.10	3.10
$N_{R,k}$ [kN] for $t_{N,I}$ [mm]	0.40	1.81	1.81	1.81	1.81	1.81
	0.50	3.10	3.10	4.10	4.14	4.14
	0.55	3.10	3.10	4.10	4.14	4.14
	0.60	3.10	3.10	4.10	4.14	4.14
	0.63	3.10	3.10	4.10	5.10	5.10
	0.70	3.10	3.10	4.10	5.50	5.50
	0.75	3.10	3.10	4.10	7.70	7.70
	0.88	3.10	3.10	4.10	7.70	7.70
	1.00	3.10	3.10	4.10	7.78	7.78
$N_{R\ II,k}$ [kN]		3.10	3.10	4.10	8.07	8.07
max. head displacement "u" depending on sandwich panel thickness [mm]	30	0.7	0.7	0.7	0.7	0.7
	40	0.9	0.9	0.9	0.9	0.9
	50	1.2	1.2	1.2	1.2	1.2
	60	1.4	1.4	1.4	1.4	1.4
	70	1.6	1.6	1.6	1.6	1.6
	80	1.8	1.8	1.8	1.8	1.8
	90	2.1	2.1	2.1	2.1	2.1
	100	2.3	2.3	2.3	2.3	2.3
	110	2.5	2.5	2.5	2.5	2.5
	120	2.8	2.8	2.8	2.8	2.8
	130	3.0	3.0	3.0	3.0	3.0
	≥140	3.2	3.2	3.2	3.2	3.2

Fastening screws for sandwich panels

Self-drilling screws ESPS-6-SP 6,3/5,5xL with hexagon head and washer S19, S22, S25, S29, A19, A22, A25 or A29

Annex 14

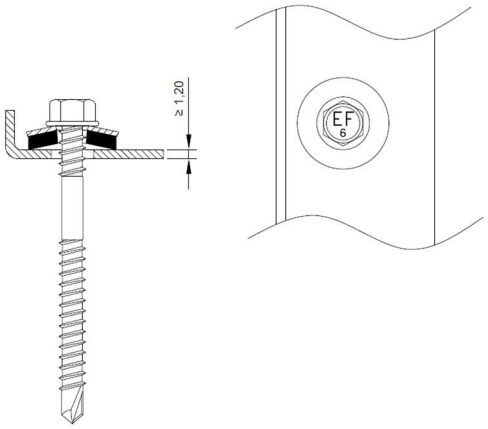
of European Technical Assessment ETA-16/0734

Materials

Fastener:	carbon steel – SAE1022, quenched, tempered and coated: galvanized with SUPER PREMIUM coating
Washer:	S19, S22, S25, S29 – stainless steel washer with EPDM ring or A19, A22, A25, A29 – aluminum washer with EPDM ring
Linear washer:	ELW-Z made of carbon steel – $R_{0,2} \geq 200$ MPa and galvanized min. 200 g/m^2 ELW-S made of stainless steel A2 – EN ISO 3506
Component I:	S280GD, S320GD or S350GD – EN 10346
Component II:	S235 to S355 – EN 10025-1 S280GD, S320GD or S350GD – EN 10346

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

Timber substructures
no performance assessed



$t_{N,II}$ [mm]		2.00	2.50	3.00	4.00	5.00
$V_{R,k}$ [kN] for $t_{N,I}$ [mm]	0.40	0.84	0.84	0.84	0.84	0.84
	0.50	1.72	1.72	1.72	1.72	1.72
	0.55	1.72	1.72	1.72	1.72	1.72
	0.60	1.72	1.72	1.72	1.72	1.72
	0.63	1.90	1.90	1.90	1.90	1.90
	0.70	1.99	1.99	1.99	1.99	1.99
	0.75	2.69	2.69	2.69	2.69	2.69
	0.88	2.69	2.69	2.69	2.69	2.69
	1.00	3.10	3.10	3.10	3.10	3.10
$N_{R,k}$ [kN] for $t_{N,I}$ [mm]	0.40	3.10	3.10	4.10	7.78	7.78
	0.50	3.10	3.10	4.10	7.78	7.78
	0.55	3.10	3.10	4.10	7.78	7.78
	0.60	3.10	3.10	4.10	7.78	7.78
	0.63	3.10	3.10	4.10	7.78	7.78
	0.70	3.10	3.10	4.10	7.78	7.78
	0.75	3.10	3.10	4.10	7.78	7.78
	0.88	3.10	3.10	4.10	7.78	7.78
	1.00	3.10	3.10	4.10	7.78	7.78
$N_{R\ II,k}$ [kN]		3.10	3.10	4.10	8.07	8.07
max. head displacement "u" depending on sandwich panel thickness [mm]	30	0.7	0.7	0.7	0.7	0.7
	40	0.9	0.9	0.9	0.9	0.9
	50	1.2	1.2	1.2	1.2	1.2
	60	1.4	1.4	1.4	1.4	1.4
	70	1.6	1.6	1.6	1.6	1.6
	80	1.8	1.8	1.8	1.8	1.8
	90	2.1	2.1	2.1	2.1	2.1
	100	2.3	2.3	2.3	2.3	2.3
	110	2.5	2.5	2.5	2.5	2.5
	120	2.8	2.8	2.8	2.8	2.8
	130	3.0	3.0	3.0	3.0	3.0
	≥140	3.2	3.2	3.2	3.2	3.2

Fastening screws for sandwich panels

Self-drilling screws ESPS-6-SP 6,3/5,5xL with hexagon head, washer S19, S22, S25, S29, A19, A22, A25 or A29 and linear washer ELW-Z or ELW-S

Annex 15

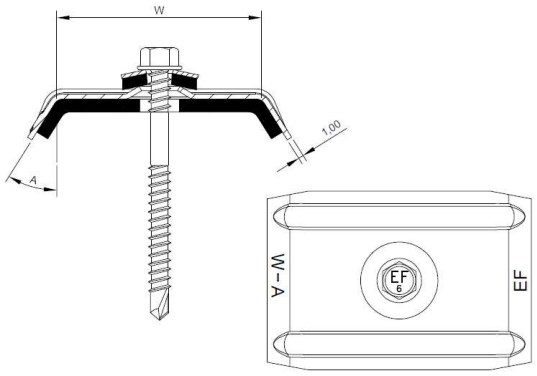
of European Technical Assessment ETA-16/0734

Materials

Fastener:	carbon steel – SAE1022, quenched, tempered and coated: galvanized with SUPER PREMIUM coating
Washer:	S19, S22, S25, S29 – stainless steel washer with EPDM ring or A19, A22, A25, A29 – aluminum washer with EPDM ring
Saddle washer:	ESW made of aluminum
Component I:	S280GD, S320GD or S350GD – EN 10346
Component II:	S235 to S355 – EN 10025-1 S280GD, S320GD or S350GD – EN 10346

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

Timber substructures
no performance assessed



$t_{N,II}$ [mm]		2.00	2.50	3.00	4.00	5.00
$V_{R,k}$ [kN] for $t_{N,I}$ [mm]	0.40	0.84	0.84	0.84	0.84	0.84
	0.50	1.72	1.72	1.72	1.72	1.72
	0.55	1.72	1.72	1.72	1.72	1.72
	0.60	1.72	1.72	1.72	1.72	1.72
	0.63	1.90	1.90	1.90	1.90	1.90
	0.70	1.99	1.99	1.99	1.99	1.99
	0.75	2.69	2.69	2.69	2.69	2.69
	0.88	2.69	2.69	2.69	2.69	2.69
	1.00	3.10	3.10	3.10	3.10	3.10
$N_{R,k}$ [kN] for $t_{N,I}$ [mm]	0.40	3.10	3.10	4.10	8.07	8.07
	0.50	3.10	3.10	4.10	8.07	8.07
	0.55	3.10	3.10	4.10	8.07	8.07
	0.60	3.10	3.10	4.10	8.07	8.07
	0.63	3.10	3.10	4.10	8.07	8.07
	0.70	3.10	3.10	4.10	8.07	8.07
	0.75	3.10	3.10	4.10	8.07	8.07
	0.88	3.10	3.10	4.10	8.07	8.07
	1.00	3.10	3.10	4.10	8.07	8.07
$N_{R\ II,k}$ [kN]		3.10	3.10	4.10	8.07	8.07
max. head displacement "u" depending on sandwich panel thickness [mm]	30	0.7	0.7	0.7	0.7	0.7
	40	0.9	0.9	0.9	0.9	0.9
	50	1.2	1.2	1.2	1.2	1.2
	60	1.4	1.4	1.4	1.4	1.4
	70	1.6	1.6	1.6	1.6	1.6
	80	1.8	1.8	1.8	1.8	1.8
	90	2.1	2.1	2.1	2.1	2.1
	100	2.3	2.3	2.3	2.3	2.3
	110	2.5	2.5	2.5	2.5	2.5
	120	2.8	2.8	2.8	2.8	2.8
	130	3.0	3.0	3.0	3.0	3.0
	≥140	3.2	3.2	3.2	3.2	3.2

Fastening screws for sandwich panels

Self-drilling screws ESPS-6-SP 6,3/5,5xL with hexagon head, washer S19, S22, S25, S29, A19, A22, A25 or A29 and saddle washer ESW

Annex 16

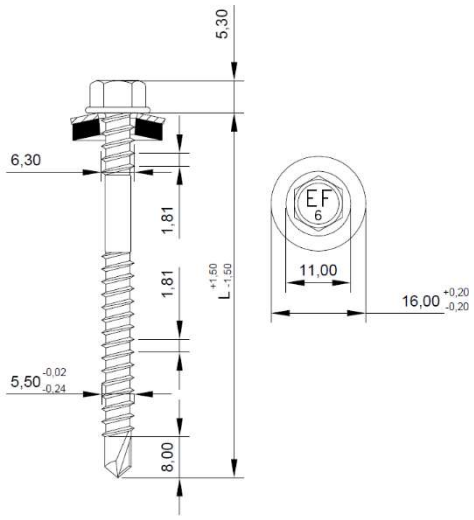
of European Technical Assessment ETA-16/0734

Materials

Fastener:	carbon steel – SAE1022, quenched, tempered and coated: galvanized with SUPER PREMIUM coating
Washer:	S16 – stainless steel washer with EPDM ring or A16 – aluminum washer with EPDM ring
Component I:	S280GD, S320GD or S350GD – EN 10346
Component II:	S235 to S355 – EN 10025-1 S280GD, S320GD or S350GD – EN 10346

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

Timber substructures
no performance assessed



$t_{N,II}$ [mm]		2.00	2.50	3.00	4.00	5.00
$V_{R,k}$ [kN] for $t_{N,I}$ [mm]	0.40	0.84	0.84	0.84	0.84	0.84
	0.50	1.72	1.72	1.72	1.72	1.72
	0.55	1.72	1.72	1.72	1.72	1.72
	0.60	1.72	1.72	1.72	1.72	1.72
	0.63	1.90	1.90	1.90	1.90	1.90
	0.70	1.99	1.99	1.99	1.99	1.99
	0.75	2.69	2.69	2.69	2.69	2.69
	0.88	2.69	2.69	2.69	2.69	2.69
	1.00	3.10	3.10	3.10	3.10	3.10
$N_{R,k}$ [kN] for $t_{N,I}$ [mm]	0.40	1.40	1.40	1.40	1.40	1.40
	0.50	2.53	2.53	2.53	2.53	2.53
	0.55	2.53	2.53	2.53	2.53	2.53
	0.60	2.77	2.77	2.77	2.77	2.77
	0.63	2.77	2.77	2.77	2.77	2.77
	0.70	2.89	2.89	2.89	2.89	2.89
	0.75	2.89	2.89	2.89	2.89	2.89
	0.88	2.89	2.89	2.89	2.89	2.89
	1.00	3.10	3.10	4.10	4.27	4.27
$N_{R\ II,k}$ [kN]		3.10	3.10	4.10	8.07	8.07
max. head displacement "u" depending on sandwich panel thickness [mm]	30	0.7	0.7	0.7	0.7	0.7
	40	0.9	0.9	0.9	0.9	0.9
	50	1.2	1.2	1.2	1.2	1.2
	60	1.4	1.4	1.4	1.4	1.4
	70	1.6	1.6	1.6	1.6	1.6
	80	1.8	1.8	1.8	1.8	1.8
	90	2.1	2.1	2.1	2.1	2.1
	100	2.3	2.3	2.3	2.3	2.3
	110	2.5	2.5	2.5	2.5	2.5
	120	2.8	2.8	2.8	2.8	2.8
	130	3.0	3.0	3.0	3.0	3.0
	≥140	3.2	3.2	3.2	3.2	3.2

Fastening screws for sandwich panels

Self-drilling screws ESPS-6-SP 6,3/5,5xL with hexagon head and washer S16 or A16

Annex 17

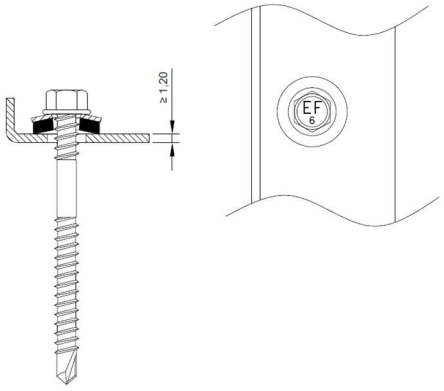
of European Technical Assessment ETA-16/0734

Materials

Fastener:	carbon steel – SAE1022, quenched, tempered and coated: galvanized with SUPER PREMIUM coating
Washer:	S16 – stainless steel washer with EPDM ring or A16 – aluminum washer with EPDM ring
Linear washer:	ELW-Z made of carbon steel – $R_{0,2} \geq 200$ MPa and galvanized min. 200 g/m^2 ELW-S made of stainless steel A2 – EN ISO 3506
Component I:	S280GD, S320GD or S350GD – EN 10346
Component II:	S235 to S355 – EN 10025-1 S280GD, S320GD or S350GD – EN 10346

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

Timber substructures
no performance assessed



$t_{N,II}$ [mm]		2.00	2.50	3.00	4.00	5.00
$V_{R,k}$ [kN] for $t_{N,I}$ [mm]	0.40	0.84	0.84	0.84	0.84	0.84
	0.50	1.72	1.72	1.72	1.72	1.72
	0.55	1.72	1.72	1.72	1.72	1.72
	0.60	1.72	1.72	1.72	1.72	1.72
	0.63	1.90	1.90	1.90	1.90	1.90
	0.70	1.99	1.99	1.99	1.99	1.99
	0.75	2.69	2.69	2.69	2.69	2.69
	0.88	2.69	2.69	2.69	2.69	2.69
	1.00	3.10	3.10	3.10	3.10	3.10
$N_{R,k}$ [kN] for $t_{N,I}$ [mm]	0.40	3.10	3.10	4.10	8.07	8.07
	0.50	3.10	3.10	4.10	8.07	8.07
	0.55	3.10	3.10	4.10	8.07	8.07
	0.60	3.10	3.10	4.10	8.07	8.07
	0.63	3.10	3.10	4.10	8.07	8.07
	0.70	3.10	3.10	4.10	8.07	8.07
	0.75	3.10	3.10	4.10	8.07	8.07
	0.88	3.10	3.10	4.10	8.07	8.07
	1.00	3.10	3.10	4.10	8.07	8.07
$N_{R\ II,k}$ [kN]		3.10	3.10	4.10	8.07	8.07
max. head displacement "u" depending on sandwich panel thickness [mm]	30	0.7	0.7	0.7	0.7	0.7
	40	0.9	0.9	0.9	0.9	0.9
	50	1.2	1.2	1.2	1.2	1.2
	60	1.4	1.4	1.4	1.4	1.4
	70	1.6	1.6	1.6	1.6	1.6
	80	1.8	1.8	1.8	1.8	1.8
	90	2.1	2.1	2.1	2.1	2.1
	100	2.3	2.3	2.3	2.3	2.3
	110	2.5	2.5	2.5	2.5	2.5
	120	2.8	2.8	2.8	2.8	2.8
	130	3.0	3.0	3.0	3.0	3.0
	≥140	3.2	3.2	3.2	3.2	3.2

Fastening screws for sandwich panels

Self-drilling screws ESPS-6-SP 6,3/5,5xL with hexagon head, washer S16 or A16 and linear washer ELW-Z or ELW-S

Annex 18

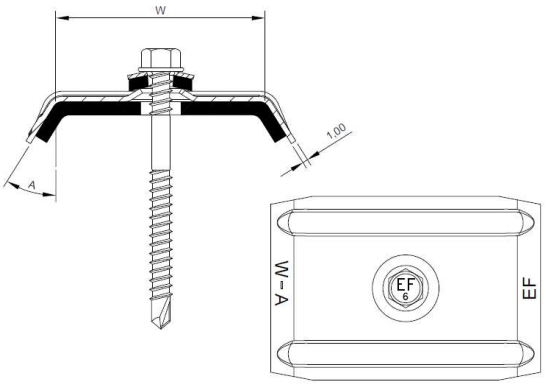
of European Technical Assessment ETA-16/0734

Materials

Fastener:	carbon steel – SAE1022, quenched, tempered and coated: galvanized with SUPER PREMIUM coating
Washer:	S16 – stainless steel washer with EPDM ring or A16 – aluminum washer with EPDM ring
Saddle washer:	ESW made of aluminum
Component I:	S280GD, S320GD or S350GD – EN 10346
Component II:	S235 to S355 – EN 10025-1 S280GD, S320GD or S350GD – EN 10346

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

Timber substructures
no performance assessed



$t_{N,II}$ [mm]		2.00	2.50	3.00	4.00	5.00
$V_{R,k}$ [kN] for $t_{N,I}$ [mm]	0.40	0.84	0.84	0.84	0.84	0.84
	0.50	1.72	1.72	1.72	1.72	1.72
	0.55	1.72	1.72	1.72	1.72	1.72
	0.60	1.72	1.72	1.72	1.72	1.72
	0.63	1.90	1.90	1.90	1.90	1.90
	0.70	1.99	1.99	1.99	1.99	1.99
	0.75	2.69	2.69	2.69	2.69	2.69
	0.88	2.69	2.69	2.69	2.69	2.69
	1.00	3.10	3.10	3.10	3.10	3.10
$N_{R,k}$ [kN] for $t_{N,I}$ [mm]	0.40	3.10	3.10	4.10	8.07	8.07
	0.50	3.10	3.10	4.10	8.07	8.07
	0.55	3.10	3.10	4.10	8.07	8.07
	0.60	3.10	3.10	4.10	8.07	8.07
	0.63	3.10	3.10	4.10	8.07	8.07
	0.70	3.10	3.10	4.10	8.07	8.07
	0.75	3.10	3.10	4.10	8.07	8.07
	0.88	3.10	3.10	4.10	8.07	8.07
	1.00	3.10	3.10	4.10	8.07	8.07
$N_{R\ II,k}$ [kN]		3.10	3.10	4.10	8.07	8.07
max. head displacement "u" depending on sandwich panel thickness [mm]	30	0.7	0.7	0.7	0.7	0.7
	40	0.9	0.9	0.9	0.9	0.9
	50	1.2	1.2	1.2	1.2	1.2
	60	1.4	1.4	1.4	1.4	1.4
	70	1.6	1.6	1.6	1.6	1.6
	80	1.8	1.8	1.8	1.8	1.8
	90	2.1	2.1	2.1	2.1	2.1
	100	2.3	2.3	2.3	2.3	2.3
	110	2.5	2.5	2.5	2.5	2.5
	120	2.8	2.8	2.8	2.8	2.8
	130	3.0	3.0	3.0	3.0	3.0
	≥140	3.2	3.2	3.2	3.2	3.2

Fastening screws for sandwich panels

Self-drilling screws ESPS-6-SP 6,3/5,5xL with hexagon head, washer S16 or A16 and saddle washer ESW

Annex 19

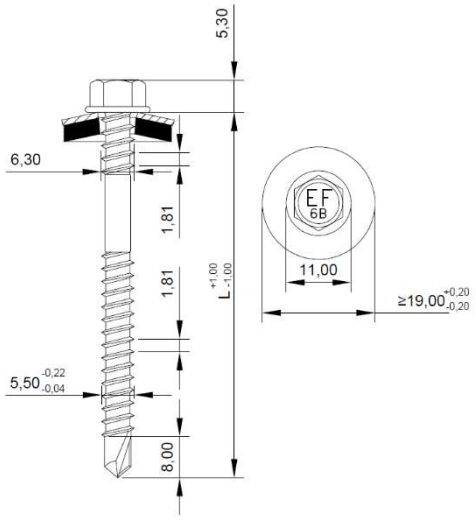
of European Technical Assessment ETA-16/0734

Materials

Fastener:	stainless steel – SAE304 (bi-metal)
Washer:	S19, S22, S25, S29 – stainless steel washer with EPDM ring
Component I:	S280GD, S320GD or S350GD – EN 10346
Component II:	S235 to S355 – EN 10025-1 S280GD, S320GD or S350GD – EN 10346

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

Timber substructures
no performance assessed



$t_{N,II}$ [mm]		2.00	2.50	3.00	4.00	5.00
$V_{R,k}$ [kN] for $t_{N,I}$ [mm]	0.40	1.07	1.07	1.07	1.07	1.07
	0.50	1.39	1.39	1.39	1.39	1.39
	0.55	1.39	1.39	1.39	1.39	1.39
	0.60	1.39	1.39	1.39	1.39	1.39
	0.63	1.39	1.39	1.39	1.39	1.39
	0.70	1.83	1.83	1.83	1.83	1.83
	0.75	1.83	1.83	1.83	1.83	1.83
	0.88	1.83	1.83	1.83	1.83	1.83
	1.00	2.73	2.73	2.73	2.73	2.73
$N_{R,k}$ [kN] for $t_{N,I}$ [mm]	0.40	2.13	2.13	2.90	2.90	2.90
	0.50	2.13	2.13	3.86	4.16	4.16
	0.55	2.13	2.13	3.86	4.16	4.16
	0.60	2.13	2.13	3.86	4.16	4.16
	0.63	2.13	2.13	3.86	4.16	4.16
	0.70	2.13	2.13	3.86	5.71	5.71
	0.75	2.13	2.13	3.86	5.71	5.71
	0.88	2.13	2.13	3.86	5.71	5.71
	1.00	2.13	2.13	3.86	6.43	6.43
$N_{R\ II,k}$ [kN]		2.13	2.13	3.86	6.43	6.43
max. head displacement "u" depending on sandwich panel thickness [mm]	30	4.5	3.6	3.0	2.3	2.1
	40	6.0	4.8	4.0	3.0	2.8
	50	7.5	6.0	5.0	3.8	3.5
	60	9.0	7.2	6.0	4.5	4.2
	70	10.5	8.4	7.0	5.3	4.9
	80	12.0	9.6	8.0	6.0	5.6
	90	13.5	10.8	9.0	6.8	6.3
	100	15.0	12.0	10.0	7.5	7.0
	110	16.5	13.2	11.0	8.3	7.7
	120	18.0	14.4	12.0	9.0	8.4
	130	19.5	15.6	13.0	9.8	9.1
	≥140	21.0	16.8	14.0	10.5	9.8

Fastening screws for sandwich panels

Self-drilling screws ESPS-6-B 6,3/5,5xL with hexagon head and washer S19, S22, S25 or S29

Annex 20

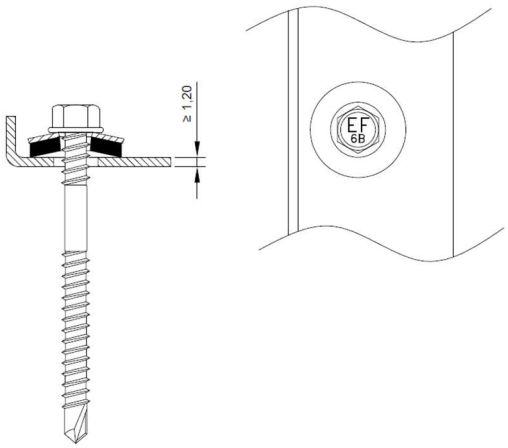
of European Technical Assessment ETA-16/0734

Materials

Fastener:	stainless steel – SAE304 (bi-metal)
Washer:	S19, S22, S25, S29 – stainless steel washer with EPDM ring
Linear washer:	ELW-S made of stainless steel A2 – EN ISO 3506
Component I:	S280GD, S320GD or S350GD – EN 10346
Component II:	S235 to S355 – EN 10025-1 S280GD, S320GD or S350GD – EN 10346

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

Timber substructures
no performance assessed



$t_{N,II}$ [mm]		2.00	2.50	3.00	4.00	5.00
$V_{R,k}$ [kN] for $t_{N,I}$ [mm]	0.40	1.07	1.07	1.07	1.07	1.07
	0.50	1.39	1.39	1.39	1.39	1.39
	0.55	1.39	1.39	1.39	1.39	1.39
	0.60	1.39	1.39	1.39	1.39	1.39
	0.63	1.39	1.39	1.39	1.39	1.39
	0.70	1.83	1.83	1.83	1.83	1.83
	0.75	1.83	1.83	1.83	1.83	1.83
	0.88	1.83	1.83	1.83	1.83	1.83
	1.00	2.73	2.73	2.73	2.73	2.73
$N_{R,k}$ [kN] for $t_{N,I}$ [mm]	0.40	2.13	2.13	3.86	6.43	6.43
	0.50	2.13	2.13	3.86	6.43	6.43
	0.55	2.13	2.13	3.86	6.43	6.43
	0.60	2.13	2.13	3.86	6.43	6.43
	0.63	2.13	2.13	3.86	6.43	6.43
	0.70	2.13	2.13	3.86	6.43	6.43
	0.75	2.13	2.13	3.86	6.43	6.43
	0.88	2.13	2.13	3.86	6.43	6.43
	1.00	2.13	2.13	3.86	6.43	6.43
$N_{R\ II,k}$ [kN]		2.13	2.13	3.86	6.43	6.43
max. head displacement "u" depending on sandwich panel thickness [mm]	30	4.5	3.6	3.0	2.3	2.1
	40	6.0	4.8	4.0	3.0	2.8
	50	7.5	6.0	5.0	3.8	3.5
	60	9.0	7.2	6.0	4.5	4.2
	70	10.5	8.4	7.0	5.3	4.9
	80	12.0	9.6	8.0	6.0	5.6
	90	13.5	10.8	9.0	6.8	6.3
	100	15.0	12.0	10.0	7.5	7.0
	110	16.5	13.2	11.0	8.3	7.7
	120	18.0	14.4	12.0	9.0	8.4
	130	19.5	15.6	13.0	9.8	9.1
	≥140	21.0	16.8	14.0	10.5	9.8

Fastening screws for sandwich panels

Self-drilling screws ESPS-6-B 6,3/5,5xL with hexagon head, washer S19, S22, S25 or S29 and linear washer ELW-S

Annex 21

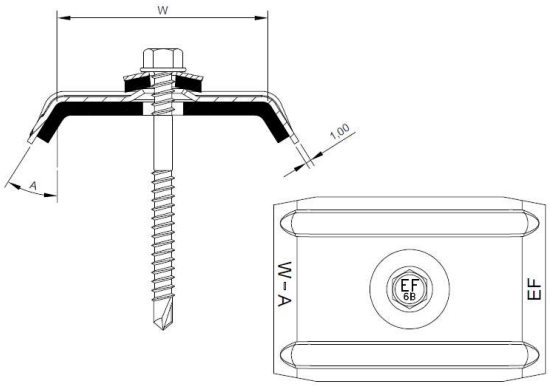
of European Technical Assessment ETA-16/0734

Materials

Fastener:	stainless steel – SAE304 (bi-metal)
Washer:	S19, S22, S25, S29 – stainless steel washer with EPDM ring
Saddle washer:	ESW made of aluminum
Component I:	S280GD, S320GD or S350GD – EN 10346
Component II:	S235 to S355 – EN 10025-1 S280GD, S320GD or S350GD – EN 10346

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

Timber substructures
no performance assessed



$t_{N,II}$ [mm]		2.00	2.50	3.00	4.00	5.00
$V_{R,k}$ [kN] for $t_{N,I}$ [mm]	0.40	1.07	1.07	1.07	1.07	1.07
	0.50	1.39	1.39	1.39	1.39	1.39
	0.55	1.39	1.39	1.39	1.39	1.39
	0.60	1.39	1.39	1.39	1.39	1.39
	0.63	1.39	1.39	1.39	1.39	1.39
	0.70	1.83	1.83	1.83	1.83	1.83
	0.75	1.83	1.83	1.83	1.83	1.83
	0.88	1.83	1.83	1.83	1.83	1.83
	1.00	2.73	2.73	2.73	2.73	2.73
$N_{R,k}$ [kN] for $t_{N,I}$ [mm]	0.40	2.13	2.13	3.86	6.43	6.43
	0.50	2.13	2.13	3.86	6.43	6.43
	0.55	2.13	2.13	3.86	6.43	6.43
	0.60	2.13	2.13	3.86	6.43	6.43
	0.63	2.13	2.13	3.86	6.43	6.43
	0.70	2.13	2.13	3.86	6.43	6.43
	0.75	2.13	2.13	3.86	6.43	6.43
	0.88	2.13	2.13	3.86	6.43	6.43
	1.00	2.13	2.13	3.86	6.43	6.43
$N_{R\ II,k}$ [kN]		2.13	2.13	3.86	6.43	6.43
max. head displacement "u" depending on sandwich panel thickness [mm]	30	4.5	3.6	3.0	2.3	2.1
	40	6.0	4.8	4.0	3.0	2.8
	50	7.5	6.0	5.0	3.8	3.5
	60	9.0	7.2	6.0	4.5	4.2
	70	10.5	8.4	7.0	5.3	4.9
	80	12.0	9.6	8.0	6.0	5.6
	90	13.5	10.8	9.0	6.8	6.3
	100	15.0	12.0	10.0	7.5	7.0
	110	16.5	13.2	11.0	8.3	7.7
	120	18.0	14.4	12.0	9.0	8.4
	130	19.5	15.6	13.0	9.8	9.1
	≥140	21.0	16.8	14.0	10.5	9.8

Fastening screws for sandwich panels

Self-drilling screws ESPS-6-B 6,3/5,5xL with hexagon head, washer S19, S22, S25 or S29 and saddle washer ESW

Annex 22

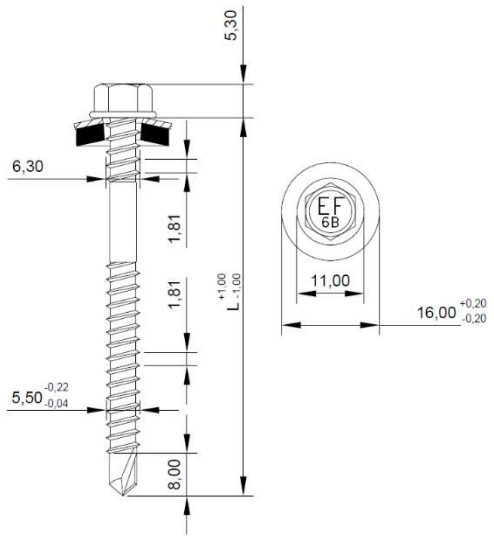
of European Technical Assessment ETA-16/0734

Materials

Fastener:	stainless steel – SAE304 (bi-metal)
Washer:	S16 – stainless steel washer with EPDM ring
Component I:	S280GD, S320GD or S350GD – EN 10346
Component II:	S235 to S355 – EN 10025-1 S280GD, S320GD or S350GD – EN 10346

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

Timber substructures
no performance assessed



$t_{N,II}$ [mm]		2.00	2.50	3.00	4.00	5.00
$V_{R,k}$ [kN] for $t_{N,I}$ [mm]	0.40	1.07	1.07	1.07	1.07	1.07
	0.50	1.39	1.39	1.39	1.39	1.39
	0.55	1.39	1.39	1.39	1.39	1.39
	0.60	1.39	1.39	1.39	1.39	1.39
	0.63	1.39	1.39	1.39	1.39	1.39
	0.70	1.83	1.83	1.83	1.83	1.83
	0.75	1.83	1.83	1.83	1.83	1.83
	0.88	1.83	1.83	1.83	1.83	1.83
	1.00	2.73	2.73	2.73	2.73	2.73
$N_{R,k}$ [kN] for $t_{N,I}$ [mm]	0.40	1.43	1.43	1.43	1.43	1.43
	0.50	2.13	2.13	2.39	2.39	2.39
	0.55	2.13	2.13	2.39	2.39	2.39
	0.60	2.13	2.13	2.87	2.87	2.87
	0.63	2.13	2.13	2.87	2.87	2.87
	0.70	2.13	2.13	3.16	3.16	3.16
	0.75	2.13	2.13	3.16	3.16	3.16
	0.88	2.13	2.13	3.16	3.16	3.16
	1.00	2.13	2.13	3.86	4.34	4.34
$N_{R\ II,k}$ [kN]		2.13	2.13	3.86	6.43	6.43
max. head displacement "u" depending on sandwich panel thickness [mm]	30	4.5	3.6	3.0	2.3	2.1
	40	6.0	4.8	4.0	3.0	2.8
	50	7.5	6.0	5.0	3.8	3.5
	60	9.0	7.2	6.0	4.5	4.2
	70	10.5	8.4	7.0	5.3	4.9
	80	12.0	9.6	8.0	6.0	5.6
	90	13.5	10.8	9.0	6.8	6.3
	100	15.0	12.0	10.0	7.5	7.0
	110	16.5	13.2	11.0	8.3	7.7
	120	18.0	14.4	12.0	9.0	8.4
	130	19.5	15.6	13.0	9.8	9.1
	≥140	21.0	16.8	14.0	10.5	9.8

Fastening screws for sandwich panels

Self-drilling screws ESPS-6-B 6,3/5,5xL with hexagon head and washer S16

Annex 23

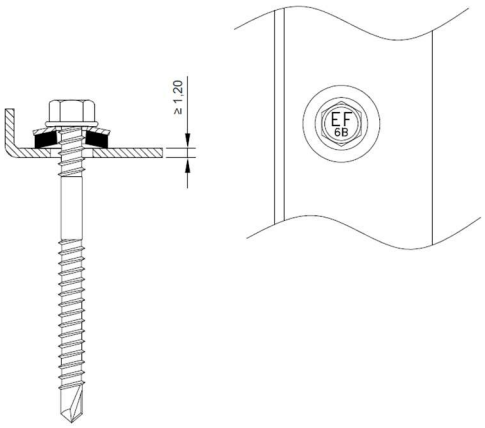
of European Technical Assessment ETA-16/0734

Materials

Fastener:	stainless steel – SAE304 (bi-metal)
Washer:	S16 – stainless steel washer with EPDM ring
Linear washer:	ELW-S made of stainless steel A2 – EN ISO 3506
Component I:	S280GD, S320GD or S350GD – EN 10346
Component II:	S235 to S355 – EN 10025-1 S280GD, S320GD or S350GD – EN 10346

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

Timber substructures
no performance assessed



$t_{N,II}$ [mm]		2.00	2.50	3.00	4.00	5.00
$V_{R,k}$ [kN] for $t_{N,I}$ [mm]	0.40	1.07	1.07	1.07	1.07	1.07
	0.50	1.39	1.39	1.39	1.39	1.39
	0.55	1.39	1.39	1.39	1.39	1.39
	0.60	1.39	1.39	1.39	1.39	1.39
	0.63	1.39	1.39	1.39	1.39	1.39
	0.70	1.83	1.83	1.83	1.83	1.83
	0.75	1.83	1.83	1.83	1.83	1.83
	0.88	1.83	1.83	1.83	1.83	1.83
	1.00	2.73	2.73	2.73	2.73	2.73
$N_{R,k}$ [kN] for $t_{N,I}$ [mm]	0.40	2.13	2.13	3.86	6.43	6.43
	0.50	2.13	2.13	3.86	6.43	6.43
	0.55	2.13	2.13	3.86	6.43	6.43
	0.60	2.13	2.13	3.86	6.43	6.43
	0.63	2.13	2.13	3.86	6.43	6.43
	0.70	2.13	2.13	3.86	6.43	6.43
	0.75	2.13	2.13	3.86	6.43	6.43
	0.88	2.13	2.13	3.86	6.43	6.43
	1.00	2.13	2.13	3.86	6.43	6.43
$N_{R\ II,k}$ [kN]		2.13	2.13	3.86	6.43	6.43
max. head displacement "u" depending on sandwich panel thickness [mm]	30	4.5	3.6	3.0	2.3	2.1
	40	6.0	4.8	4.0	3.0	2.8
	50	7.5	6.0	5.0	3.8	3.5
	60	9.0	7.2	6.0	4.5	4.2
	70	10.5	8.4	7.0	5.3	4.9
	80	12.0	9.6	8.0	6.0	5.6
	90	13.5	10.8	9.0	6.8	6.3
	100	15.0	12.0	10.0	7.5	7.0
	110	16.5	13.2	11.0	8.3	7.7
	120	18.0	14.4	12.0	9.0	8.4
	130	19.5	15.6	13.0	9.8	9.1
	≥140	21.0	16.8	14.0	10.5	9.8

Fastening screws for sandwich panels

Self-drilling screws ESPS-6-B 6,3/5,5xL with hexagon head, washer S16 and linear washer ELW-S

Annex 24

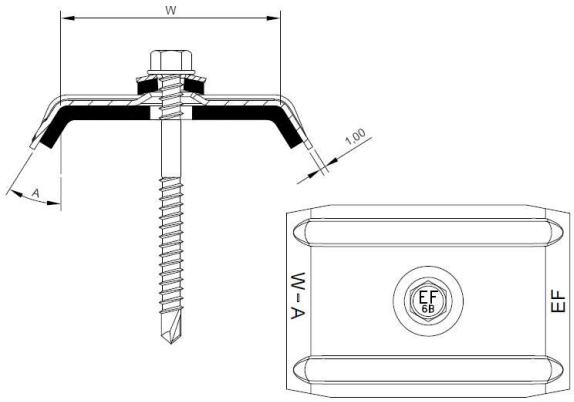
of European Technical Assessment ETA-16/0734

Materials

Fastener:	stainless steel – SAE304 (bi-metal)
Washer:	S16 – stainless steel washer with EPDM ring
Saddle washer:	ESW made of aluminum
Component I:	S280GD, S320GD or S350GD – EN 10346
Component II:	S235 to S355 – EN 10025-1 S280GD, S320GD or S350GD – EN 10346

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

Timber substructures
no performance assessed



$t_{N,II}$ [mm]		2.00	2.50	3.00	4.00	5.00
$V_{R,k}$ [kN] for $t_{N,I}$ [mm]	0.40	1.07	1.07	1.07	1.07	1.07
	0.50	1.39	1.39	1.39	1.39	1.39
	0.55	1.39	1.39	1.39	1.39	1.39
	0.60	1.39	1.39	1.39	1.39	1.39
	0.63	1.39	1.39	1.39	1.39	1.39
	0.70	1.83	1.83	1.83	1.83	1.83
	0.75	1.83	1.83	1.83	1.83	1.83
	0.88	1.83	1.83	1.83	1.83	1.83
	1.00	2.73	2.73	2.73	2.73	2.73
$N_{R,k}$ [kN] for $t_{N,I}$ [mm]	0.40	2.13	2.13	3.86	6.43	6.43
	0.50	2.13	2.13	3.86	6.43	6.43
	0.55	2.13	2.13	3.86	6.43	6.43
	0.60	2.13	2.13	3.86	6.43	6.43
	0.63	2.13	2.13	3.86	6.43	6.43
	0.70	2.13	2.13	3.86	6.43	6.43
	0.75	2.13	2.13	3.86	6.43	6.43
	0.88	2.13	2.13	3.86	6.43	6.43
	1.00	2.13	2.13	3.86	6.43	6.43
$N_{R\ II,k}$ [kN]		2.13	2.13	3.86	6.43	6.43
max. head displacement "u" depending on sandwich panel thickness [mm]	30	4.5	3.6	3.0	2.3	2.1
	40	6.0	4.8	4.0	3.0	2.8
	50	7.5	6.0	5.0	3.8	3.5
	60	9.0	7.2	6.0	4.5	4.2
	70	10.5	8.4	7.0	5.3	4.9
	80	12.0	9.6	8.0	6.0	5.6
	90	13.5	10.8	9.0	6.8	6.3
	100	15.0	12.0	10.0	7.5	7.0
	110	16.5	13.2	11.0	8.3	7.7
	120	18.0	14.4	12.0	9.0	8.4
	130	19.5	15.6	13.0	9.8	9.1
	≥140	21.0	16.8	14.0	10.5	9.8

Fastening screws for sandwich panels

Self-drilling screws ESPS-6-B 6,3/5,5xL with hexagon head, washer S16 and saddle washer ESW

Annex 25

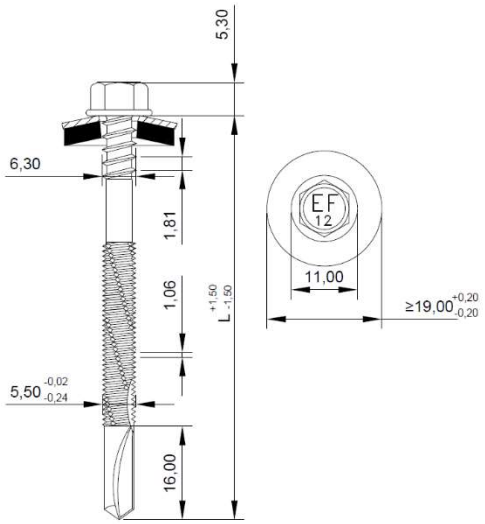
of European Technical Assessment ETA-16/0734

Materials

Fastener:	carbon steel – SAE1022, quenched, tempered and coated: galvanized (12 µm)
Washer:	Z19, Z22, Z25, Z29 – carbon steel washer with EPDM ring
Component I:	S280GD, S320GD or S350GD – EN 10346
Component II:	S235 to S355 – EN 10025-1 S280GD, S320GD or S350GD – EN 10346

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

Timber substructures
no performance assessed



$t_{N,II}$ [mm]		4.00	5.00	6.00	8.00	10.00	11.00
$V_{R,k}$ [kN] for $t_{N,I}$ [mm]	0.40	0.84	0.84	0.84	0.84	0.84	0.84
	0.50	1.72	1.72	1.72	1.72	1.72	1.72
	0.55	1.72	1.72	1.72	1.72	1.72	1.72
	0.60	1.72	1.72	1.72	1.72	1.72	1.72
	0.63	1.90	1.90	1.90	1.90	1.90	1.90
	0.70	1.99	1.99	1.99	1.99	1.99	1.99
	0.75	2.69	2.69	2.69	2.69	2.69	2.69
	0.88	2.69	2.69	2.69	2.69	2.69	2.69
	1.00	3.10	3.10	3.10	3.10	3.10	3.10
$N_{R,k}$ [kN] for $t_{N,I}$ [mm]	0.40	1.81	1.81	1.81	1.81	1.81	1.81
	0.50	4.14	4.14	4.14	4.14	4.14	4.14
	0.55	4.14	4.14	4.14	4.14	4.14	4.14
	0.60	4.14	4.14	4.14	4.14	4.14	4.14
	0.63	5.10	5.10	5.10	5.10	5.10	5.10
	0.70	5.50	5.50	5.50	5.50	5.50	5.50
	0.75	7.70	7.70	7.70	7.70	7.70	7.70
	0.88	7.70	7.70	7.70	7.70	7.70	7.70
	1.00	7.78	7.78	7.78	7.78	7.78	7.78
$N_{R\,II,k}$ [kN]		7.93	7.93	11.34	11.34	11.34	11.34
max. head displacement "u" depending on sandwich panel thickness [mm]	30	0.7	0.7	0.7	0.7	0.7	0.7
	40	0.9	0.9	0.9	0.9	0.9	0.9
	50	1.2	1.2	1.2	1.2	1.2	1.2
	60	1.4	1.4	1.4	1.4	1.4	1.4
	70	1.6	1.6	1.6	1.6	1.6	1.6
	80	1.8	1.8	1.8	1.8	1.8	1.8
	90	2.1	2.1	2.1	2.1	2.1	2.1
	100	2.3	2.3	2.3	2.3	2.3	2.3
	110	2.5	2.5	2.5	2.5	2.5	2.5
	120	2.8	2.8	2.8	2.8	2.8	2.8
	130	3.0	3.0	3.0	3.0	3.0	3.0
	≥140	3.2	3.2	3.2	3.2	3.2	3.2

Fastening screws for sandwich panels

Self-drilling screws ESPS-12-Z 6,3/5,5xL with hexagon head and washer Z19, Z22, Z25 or Z29

Annex 26

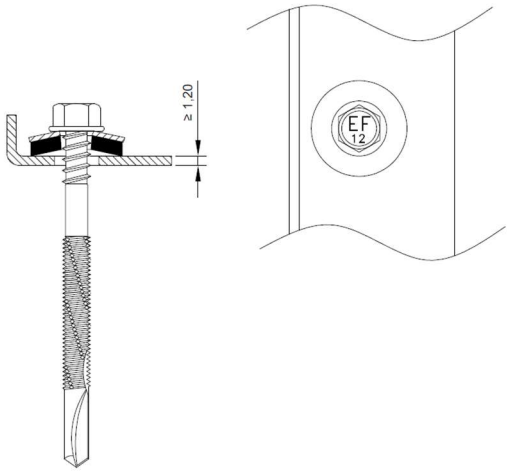
of European Technical Assessment ETA-16/0734

Materials

Fastener:	carbon steel – SAE1022, quenched, tempered and coated: galvanized (12 µm)
Washer:	Z19, Z22, Z25, Z29 – carbon steel washer with EPDM ring
Linear washer:	ELW-Z made of carbon steel – $R_{0,2}$ ≥ 200 MPa and galvanized min. 200 g/m² ELW-S made of stainless steel A2 – EN ISO 3506
Component I:	S280GD, S320GD or S350GD – EN 10346
Component II:	S235 to S355 – EN 10025-1 S280GD, S320GD or S350GD – EN 10346

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

Timber substructures
no performance assessed



$t_{N,II}$ [mm]		4.00	5.00	6.00	8.00	10.00	11.00
$V_{R,k}$ [kN] for $t_{N,I}$ [mm]	0.40	0 ,84	0.84	0.84	0.84	0.84	0.84
	0.50	1.72	1.72	1.72	1.72	1.72	1.72
	0.55	1.72	1.72	1.72	1.72	1.72	1.72
	0.60	1.72	1.72	1.72	1.72	1.72	1.72
	0.63	1.90	1.90	1.90	1.90	1.90	1.90
	0.70	1.99	1.99	1.99	1.99	1.99	1.99
	0.75	2.69	2.69	2.69	2.69	2.69	2.69
	0.88	2.69	2.69	2.69	2.69	2.69	2.69
	1.00	3.10	3.10	3.10	3.10	3.10	3.10
$N_{R,k}$ [kN] for $t_{N,I}$ [mm]	0.40	7.78	7.78	7.78	7.78	7.78	7.78
	0.50	7.78	7.78	7.78	7.78	7.78	7.78
	0.55	7.78	7.78	7.78	7.78	7.78	7.78
	0.60	7.78	7.78	7.78	7.78	7.78	7.78
	0.63	7.78	7.78	7.78	7.78	7.78	7.78
	0.70	7.78	7.78	7.78	7.78	7.78	7.78
	0.75	7.78	7.78	7.78	7.78	7.78	7.78
	0.88	7.78	7.78	7.78	7.78	7.78	7.78
	1.00	7.78	7.78	7.78	7.78	7.78	7.78
$N_{R\,II,k}$ [kN]		7.93	7.93	11.34	11.34	11.34	11.34
max. head displacement "u" depending on sandwich panel thickness [mm]	30	0.7	0.7	0.7	0.7	0.7	0.7
	40	0.9	0.9	0.9	0.9	0.9	0.9
	50	1.2	1.2	1.2	1.2	1.2	1.2
	60	1.4	1.4	1.4	1.4	1.4	1.4
	70	1.6	1.6	1.6	1.6	1.6	1.6
	80	1.8	1.8	1.8	1.8	1.8	1.8
	90	2.1	2.1	2.1	2.1	2.1	2.1
	100	2.3	2.3	2.3	2.3	2.3	2.3
	110	2.5	2.5	2.5	2.5	2.5	2.5
	120	2.8	2.8	2.8	2.8	2.8	2.8
	130	3.0	3.0	3.0	3.0	3.0	3.0
	≥140	3.2	3.2	3.2	3.2	3.2	3.2

Fastening screws for sandwich panels

Self-drilling screws ESPS-12-Z 6,3/5,5xL with hexagon head, washer Z19, Z22, Z25 or Z29 and linear washer ELW-Z or ELW-S

Annex 27

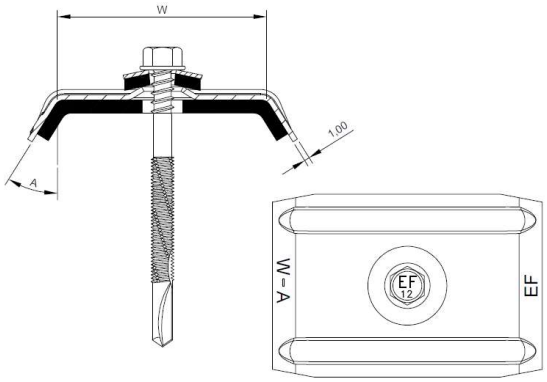
of European Technical Assessment ETA-16/0734

Materials

Fastener:	carbon steel – SAE1022, quenched, tempered and coated: galvanized (12 µm)
Washer:	Z19, Z22, Z25, Z29 – carbon steel washer with EPDM ring
Saddle washer:	ESW made of aluminum
Component I:	S280GD, S320GD or S350GD – EN 10346
Component II:	S235 to S355 – EN 10025-1 S280GD, S320GD or S350GD – EN 10346

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

Timber substructures
no performance assessed



$t_{N,II}$ [mm]		4.00	5.00	6.00	8.00	10.00	11.00
$V_{R,k}$ [kN] for $t_{N,I}$ [mm]	0.40	0 ,84	0.84	0.84	0.84	0.84	0.84
	0.50	1.72	1.72	1.72	1.72	1.72	1.72
	0.55	1.72	1.72	1.72	1.72	1.72	1.72
	0.60	1.72	1.72	1.72	1.72	1.72	1.72
	0.63	1.90	1.90	1.90	1.90	1.90	1.90
	0.70	1.99	1.99	1.99	1.99	1.99	1.99
	0.75	2.69	2.69	2.69	2.69	2.69	2.69
	0.88	2.69	2.69	2.69	2.69	2.69	2.69
	1.00	3.10	3.10	3.10	3.10	3.10	3.10
$N_{R,k}$ [kN] for $t_{N,I}$ [mm]	0.40	7.93	7.93	10.14	10.14	10.14	10.14
	0.50	7.93	7.93	10.90	10.90	10.90	10.90
	0.55	7.93	7.93	10.90	10.90	10.90	10.90
	0.60	7.93	7.93	10.90	10.90	10.90	10.90
	0.63	7.93	7.93	10.90	10.90	10.90	10.90
	0.70	7.93	7.93	10.90	10.90	10.90	10.90
	0.75	7.93	7.93	10.90	10.90	10.90	10.90
	0.88	7.93	7.93	10.90	10.90	10.90	10.90
	1.00	7.93	7.93	10.90	10.90	10.90	10.90
$N_{R\,II,k}$ [kN]		7.93	7.93	11.34	11.34	11.34	11.34
max. head displacement "u" depending on sandwich panel thickness [mm]	30	0.7	0.7	0.7	0.7	0.7	0.7
	40	0.9	0.9	0.9	0.9	0.9	0.9
	50	1.2	1.2	1.2	1.2	1.2	1.2
	60	1.4	1.4	1.4	1.4	1.4	1.4
	70	1.6	1.6	1.6	1.6	1.6	1.6
	80	1.8	1.8	1.8	1.8	1.8	1.8
	90	2.1	2.1	2.1	2.1	2.1	2.1
	100	2.3	2.3	2.3	2.3	2.3	2.3
	110	2.5	2.5	2.5	2.5	2.5	2.5
	120	2.8	2.8	2.8	2.8	2.8	2.8
	130	3.0	3.0	3.0	3.0	3.0	3.0
	≥140	3.2	3.2	3.2	3.2	3.2	3.2

Fastening screws for sandwich panels

Self-drilling screws ESPS-12-Z 6,3/5,5xL with hexagon head, washer Z19, Z22, Z25 or Z29 and saddle washer ESW

Annex 28

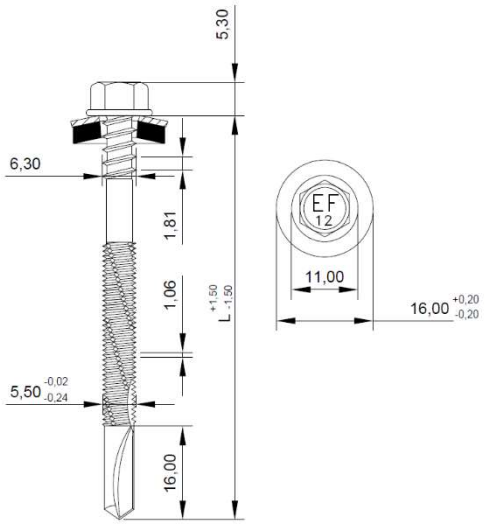
of European Technical Assessment ETA-16/0734

Materials

Fastener:	carbon steel – SAE1022, quenched, tempered and coated: galvanized (12 µm)
Washer:	Z16 – carbon steel washer with EPDM ring
Component I:	S280GD, S320GD or S350GD – EN 10346
Component II:	S235 to S355 – EN 10025-1 S280GD, S320GD or S350GD – EN 10346

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

Timber substructures
no performance assessed



$t_{N,II}$ [mm]		4.00	5.00	6.00	8.00	10.00	11.00
$V_{R,k}$ [kN] for $t_{N,I}$ [mm]	0.40	0.84	0.84	0.84	0.84	0.84	0.84
	0.50	1.72	1.72	1.72	1.72	1.72	1.72
	0.55	1.72	1.72	1.72	1.72	1.72	1.72
	0.60	1.72	1.72	1.72	1.72	1.72	1.72
	0.63	1.90	1.90	1.90	1.90	1.90	1.90
	0.70	1.99	1.99	1.99	1.99	1.99	1.99
	0.75	2.69	2.69	2.69	2.69	2.69	2.69
	0.88	2.69	2.69	2.69	2.69	2.69	2.69
	1.00	3.10	3.10	3.10	3.10	3.10	3.10
$N_{R,k}$ [kN] for $t_{N,I}$ [mm]	0.40	1.40	1.40	1.40	1.40	1.40	1.40
	0.50	2.53	2.53	2.53	2.53	2.53	2.53
	0.55	2.53	2.53	2.53	2.53	2.53	2.53
	0.60	2.77	2.77	2.77	2.77	2.77	2.77
	0.63	2.77	2.77	2.77	2.77	2.77	2.77
	0.70	2.89	2.89	2.89	2.89	2.89	2.89
	0.75	2.89	2.89	2.89	2.89	2.89	2.89
	0.88	2.89	2.89	2.89	2.89	2.89	2.89
	1.00	4.27	4.27	4.27	4.27	4.27	4.27
$N_{R\ II,k}$ [kN]		7.93	7.93	11.34	11.34	11.34	11.34
max. head displacement "u" depending on sandwich panel thickness [mm]	30	0.7	0.7	0.7	0.7	0.7	0.7
	40	0.9	0.9	0.9	0.9	0.9	0.9
	50	1.2	1.2	1.2	1.2	1.2	1.2
	60	1.4	1.4	1.4	1.4	1.4	1.4
	70	1.6	1.6	1.6	1.6	1.6	1.6
	80	1.8	1.8	1.8	1.8	1.8	1.8
	90	2.1	2.1	2.1	2.1	2.1	2.1
	100	2.3	2.3	2.3	2.3	2.3	2.3
	110	2.5	2.5	2.5	2.5	2.5	2.5
	120	2.8	2.8	2.8	2.8	2.8	2.8
	130	3.0	3.0	3.0	3.0	3.0	3.0
	≥140	3.2	3.2	3.2	3.2	3.2	3.2

Fastening screws for sandwich panels

Self-drilling screws ESPS-12-Z 6,3/5,5xL with hexagon head and washer Z16

Annex 29

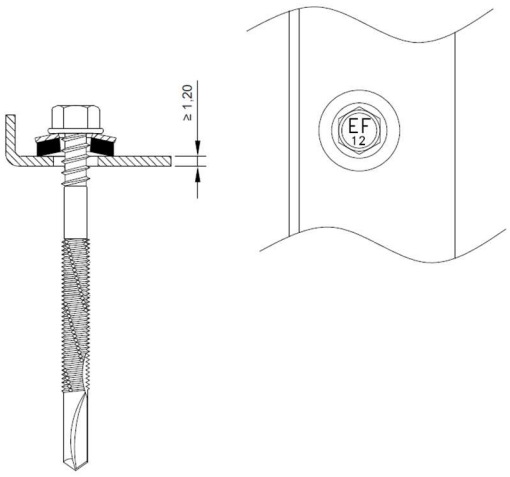
of European Technical Assessment ETA-16/0734

Materials

Fastener:	carbon steel – SAE1022, quenched, tempered and coated: galvanized (12 µm)
Washer:	Z16 – carbon steel washer with EPDM ring
Linear washer:	ELW-Z made of carbon steel – $R_{0,2} \geq 200$ MPa and galvanized min. 200 g/m² ELW-S made of stainless steel A2 – EN ISO 3506
Component I:	S280GD, S320GD or S350GD – EN 10346
Component II:	S235 to S355 – EN 10025-1 S280GD, S320GD or S350GD – EN 10346

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

Timber substructures
no performance assessed



$t_{N,II}$ [mm]		4.00	5.00	6.00	8.00	10.00	11.00
$V_{R,k}$ [kN] for $t_{N,I}$ [mm]	0.40	0.84	0.84	0.84	0.84	0.84	0.84
	0.50	1.72	1.72	1.72	1.72	1.72	1.72
	0.55	1.72	1.72	1.72	1.72	1.72	1.72
	0.60	1.72	1.72	1.72	1.72	1.72	1.72
	0.63	1.90	1.90	1.90	1.90	1.90	1.90
	0.70	1.99	1.99	1.99	1.99	1.99	1.99
	0.75	2.69	2.69	2.69	2.69	2.69	2.69
	0.88	2.69	2.69	2.69	2.69	2.69	2.69
	1.00	3.10	3.10	3.10	3.10	3.10	3.10
$N_{R,k}$ [kN] for $t_{N,I}$ [mm]	0.40	7.93	7.93	11.34	11.34	11.34	11.34
	0.50	7.93	7.93	11.34	11.34	11.34	11.34
	0.55	7.93	7.93	11.34	11.34	11.34	11.34
	0.60	7.93	7.93	11.34	11.34	11.34	11.34
	0.63	7.93	7.93	11.34	11.34	11.34	11.34
	0.70	7.93	7.93	11.34	11.34	11.34	11.34
	0.75	7.93	7.93	11.34	11.34	11.34	11.34
	0.88	7.93	7.93	11.34	11.34	11.34	11.34
	1.00	7.93	7.93	11.34	11.34	11.34	11.34
$N_{R\,II,k}$ [kN]		7.93	7.93	11.34	11.34	11.34	11.34
max. head displacement "u" depending on sandwich panel thickness [mm]	30	0.7	0.7	0.7	0.7	0.7	0.7
	40	0.9	0.9	0.9	0.9	0.9	0.9
	50	1.2	1.2	1.2	1.2	1.2	1.2
	60	1.4	1.4	1.4	1.4	1.4	1.4
	70	1.6	1.6	1.6	1.6	1.6	1.6
	80	1.8	1.8	1.8	1.8	1.8	1.8
	90	2.1	2.1	2.1	2.1	2.1	2.1
	100	2.3	2.3	2.3	2.3	2.3	2.3
	110	2.5	2.5	2.5	2.5	2.5	2.5
	120	2.8	2.8	2.8	2.8	2.8	2.8
	130	3.0	3.0	3.0	3.0	3.0	3.0
	≥140	3.2	3.2	3.2	3.2	3.2	3.2

Fastening screws for sandwich panels

Self-drilling screws ESPS-12-Z 6,3/5,5xL with hexagon head, washer Z16 and linear washer ELW-Z or ELW-S

Annex 30

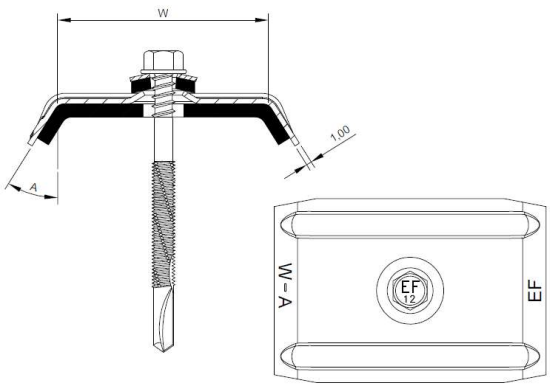
of European Technical Assessment ETA-16/0734

Materials

Fastener:	carbon steel – SAE1022, quenched, tempered and coated: galvanized (12 µm)
Washer:	Z16 – carbon steel washer with EPDM ring
Saddle washer:	ESW made of aluminum
Component I:	S280GD, S320GD or S350GD – EN 10346
Component II:	S235 to S355 – EN 10025-1 S280GD, S320GD or S350GD – EN 10346

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

Timber substructures
no performance assessed



$t_{N,II}$ [mm]		4.00	5.00	6.00	8.00	10.00	11.00
$V_{R,k}$ [kN] for $t_{N,I}$ [mm]	0.40	0.84	0.84	0.84	0.84	0.84	0.84
	0.50	1.72	1.72	1.72	1.72	1.72	1.72
	0.55	1.72	1.72	1.72	1.72	1.72	1.72
	0.60	1.72	1.72	1.72	1.72	1.72	1.72
	0.63	1.90	1.90	1.90	1.90	1.90	1.90
	0.70	1.99	1.99	1.99	1.99	1.99	1.99
	0.75	2.69	2.69	2.69	2.69	2.69	2.69
	0.88	2.69	2.69	2.69	2.69	2.69	2.69
	1.00	3.10	3.10	3.10	3.10	3.10	3.10
$N_{R,k}$ [kN] for $t_{N,I}$ [mm]	0.40	7.93	7.93	10.53	10.53	10.53	10.53
	0.50	7.93	7.93	10.92	10.92	10.92	10.92
	0.55	7.93	7.93	10.92	10.92	10.92	10.92
	0.60	7.93	7.93	10.92	10.92	10.92	10.92
	0.63	7.93	7.93	10.92	10.92	10.92	10.92
	0.70	7.93	7.93	10.92	10.92	10.92	10.92
	0.75	7.93	7.93	10.92	10.92	10.92	10.92
	0.88	7.93	7.93	10.92	10.92	10.92	10.92
	1.00	7.93	7.93	10.92	10.92	10.92	10.92
$N_{R\,II,k}$ [kN]		7.93	7.93	11.34	11.34	11.34	11.34
max. head displacement "u" depending on sandwich panel thickness [mm]	30	0.7	0.7	0.7	0.7	0.7	0.7
	40	0.9	0.9	0.9	0.9	0.9	0.9
	50	1.2	1.2	1.2	1.2	1.2	1.2
	60	1.4	1.4	1.4	1.4	1.4	1.4
	70	1.6	1.6	1.6	1.6	1.6	1.6
	80	1.8	1.8	1.8	1.8	1.8	1.8
	90	2.1	2.1	2.1	2.1	2.1	2.1
	100	2.3	2.3	2.3	2.3	2.3	2.3
	110	2.5	2.5	2.5	2.5	2.5	2.5
	120	2.8	2.8	2.8	2.8	2.8	2.8
	130	3.0	3.0	3.0	3.0	3.0	3.0
	≥140	3.2	3.2	3.2	3.2	3.2	3.2

Fastening screws for sandwich panels

Self-drilling screws ESPS-12-Z 6,3/5,5xL with hexagon head, washer Z16 and saddle washer ESW

Annex 31

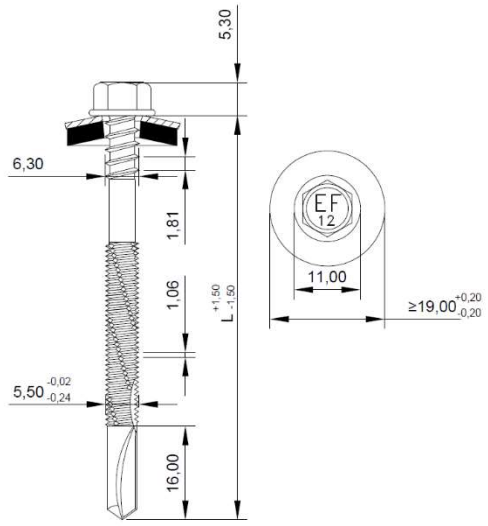
of European Technical Assessment ETA-16/0734

Materials

Fastener:	carbon steel – SAE1022, quenched, tempered and coated: galvanized with PREMIUM coating
Washer:	A19, A22, A25, A29 – aluminum washer with EPDM ring
Component I:	S280GD, S320GD or S350GD – EN 10346
Component II:	S235 to S355 – EN 10025-1 S280GD, S320GD or S350GD – EN 10346

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

Timber substructures
no performance assessed



$t_{N,II}$ [mm]		4.00	5.00	6.00	8.00	10.00	11.00
$V_{R,k}$ [kN] for $t_{N,I}$ [mm]	0.40	0.84	0.84	0.84	0.84	0.84	0.84
	0.50	1.72	1.72	1.72	1.72	1.72	1.72
	0.55	1.72	1.72	1.72	1.72	1.72	1.72
	0.60	1.72	1.72	1.72	1.72	1.72	1.72
	0.63	1.90	1.90	1.90	1.90	1.90	1.90
	0.70	1.99	1.99	1.99	1.99	1.99	1.99
	0.75	2.69	2.69	2.69	2.69	2.69	2.69
	0.88	2.69	2.69	2.69	2.69	2.69	2.69
	1.00	3.10	3.10	3.10	3.10	3.10	3.10
$N_{R,k}$ [kN] for $t_{N,I}$ [mm]	0.40	1.81	1.81	1.81	1.81	1.81	1.81
	0.50	4.14	4.14	4.14	4.14	4.14	4.14
	0.55	4.14	4.14	4.14	4.14	4.14	4.14
	0.60	4.14	4.14	4.14	4.14	4.14	4.14
	0.63	5.10	5.10	5.10	5.10	5.10	5.10
	0.70	5.50	5.50	5.50	5.50	5.50	5.50
	0.75	7.70	7.70	7.70	7.70	7.70	7.70
	0.88	7.70	7.70	7.70	7.70	7.70	7.70
	1.00	7.78	7.78	7.78	7.78	7.78	7.78
$N_{R\,II,k}$ [kN]		7.93	7.93	11.34	11.34	11.34	11.34
max. head displacement "u" depending on sandwich panel thickness [mm]	30	0.7	0.7	0.7	0.7	0.7	0.7
	40	0.9	0.9	0.9	0.9	0.9	0.9
	50	1.2	1.2	1.2	1.2	1.2	1.2
	60	1.4	1.4	1.4	1.4	1.4	1.4
	70	1.6	1.6	1.6	1.6	1.6	1.6
	80	1.8	1.8	1.8	1.8	1.8	1.8
	90	2.1	2.1	2.1	2.1	2.1	2.1
	100	2.3	2.3	2.3	2.3	2.3	2.3
	110	2.5	2.5	2.5	2.5	2.5	2.5
	120	2.8	2.8	2.8	2.8	2.8	2.8
	130	3.0	3.0	3.0	3.0	3.0	3.0
	≥140	3.2	3.2	3.2	3.2	3.2	3.2

Fastening screws for sandwich panels

Self-drilling screws ESPS-12-P 6,3/5,5xL with hexagon head and washer A19, A22, A25 or A29

Annex 32

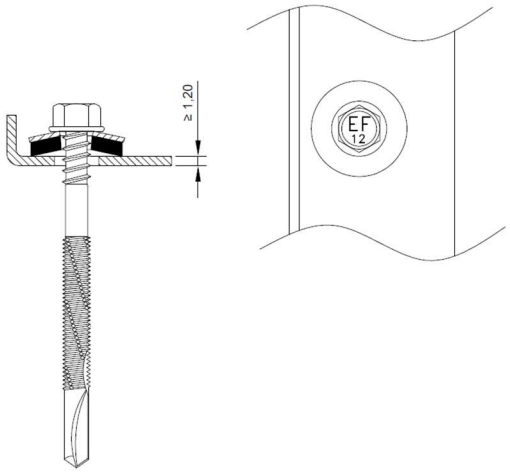
of European Technical Assessment ETA-16/0734

Materials

Fastener:	carbon steel – SAE1022, quenched, tempered and coated: galvanized with PREMIUM coating
Washer:	A19, A22, A25, A29 – aluminum washer with EPDM ring
Linear washer:	ELW-Z made of carbon steel – $R_{0,2} \geq 200$ MPa and galvanized min. 200 g/m^2 ELW-S made of stainless steel A2 – EN ISO 3506
Component I:	S280GD, S320GD or S350GD – EN 10346
Component II:	S235 to S355 – EN 10025-1 S280GD, S320GD or S350GD – EN 10346

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

Timber substructures
no performance assessed



$t_{N,II}$ [mm]		4.00	5.00	6.00	8.00	10.00	11.00
$V_{R,k}$ [kN] for $t_{N,I}$ [mm]	0.40	0.84	0.84	0.84	0.84	0.84	0.84
	0.50	1.72	1.72	1.72	1.72	1.72	1.72
	0.55	1.72	1.72	1.72	1.72	1.72	1.72
	0.60	1.72	1.72	1.72	1.72	1.72	1.72
	0.63	1.90	1.90	1.90	1.90	1.90	1.90
	0.70	1.99	1.99	1.99	1.99	1.99	1.99
	0.75	2.69	2.69	2.69	2.69	2.69	2.69
	0.88	2.69	2.69	2.69	2.69	2.69	2.69
	1.00	3.10	3.10	3.10	3.10	3.10	3.10
$N_{R,k}$ [kN] for $t_{N,I}$ [mm]	0.40	7.78	7.78	7.78	7.78	7.78	7.78
	0.50	7.78	7.78	7.78	7.78	7.78	7.78
	0.55	7.78	7.78	7.78	7.78	7.78	7.78
	0.60	7.78	7.78	7.78	7.78	7.78	7.78
	0.63	7.78	7.78	7.78	7.78	7.78	7.78
	0.70	7.78	7.78	7.78	7.78	7.78	7.78
	0.75	7.78	7.78	7.78	7.78	7.78	7.78
	0.88	7.78	7.78	7.78	7.78	7.78	7.78
	1.00	7.78	7.78	7.78	7.78	7.78	7.78
$N_{R\,II,k}$ [kN]		7.93	7.93	11.34	11.34	11.34	11.34
max. head displacement "u" depending on sandwich panel thickness [mm]	30	0.7	0.7	0.7	0.7	0.7	0.7
	40	0.9	0.9	0.9	0.9	0.9	0.9
	50	1.2	1.2	1.2	1.2	1.2	1.2
	60	1.4	1.4	1.4	1.4	1.4	1.4
	70	1.6	1.6	1.6	1.6	1.6	1.6
	80	1.8	1.8	1.8	1.8	1.8	1.8
	90	2.1	2.1	2.1	2.1	2.1	2.1
	100	2.3	2.3	2.3	2.3	2.3	2.3
	110	2.5	2.5	2.5	2.5	2.5	2.5
	120	2.8	2.8	2.8	2.8	2.8	2.8
	130	3.0	3.0	3.0	3.0	3.0	3.0
	≥140	3.2	3.2	3.2	3.2	3.2	3.2

Fastening screws for sandwich panels

Self-drilling screws ESPS-12-P 6,3/5,5xL with hexagon head, washer A19, A22, A25 or A29 and linear washer ELW-Z or ELW-S

Annex 33

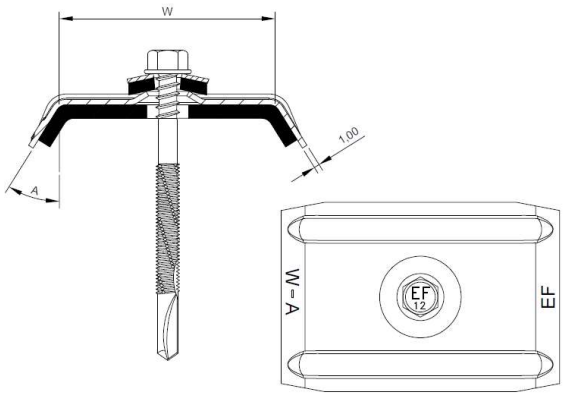
of European Technical Assessment ETA-16/0734

Materials

Fastener:	carbon steel – SAE1022, quenched, tempered and coated: galvanized with PREMIUM coating
Washer:	A19, A22, A25, A29 – aluminum washer with EPDM ring
Saddle washer:	ESW made of aluminum
Component I:	S280GD, S320GD or S350GD – EN 10346
Component II:	S235 to S355 – EN 10025-1 S280GD, S320GD or S350GD – EN 10346

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

Timber substructures
no performance assessed



$t_{N,II}$ [mm]		4.00	5.00	6.00	8.00	10.00	11.00
$V_{R,k}$ [kN] for $t_{N,I}$ [mm]	0.40	0.84	0.84	0.84	0.84	0.84	0.84
	0.50	1.72	1.72	1.72	1.72	1.72	1.72
	0.55	1.72	1.72	1.72	1.72	1.72	1.72
	0.60	1.72	1.72	1.72	1.72	1.72	1.72
	0.63	1.90	1.90	1.90	1.90	1.90	1.90
	0.70	1.99	1.99	1.99	1.99	1.99	1.99
	0.75	2.69	2.69	2.69	2.69	2.69	2.69
	0.88	2.69	2.69	2.69	2.69	2.69	2.69
	1.00	3.10	3.10	3.10	3.10	3.10	3.10
$N_{R,k}$ [kN] for $t_{N,I}$ [mm]	0.40	7.93	7.93	10.14	10.14	10.14	10.14
	0.50	7.93	7.93	10.90	10.90	10.90	10.90
	0.55	7.93	7.93	10.90	10.90	10.90	10.90
	0.60	7.93	7.93	10.90	10.90	10.90	10.90
	0.63	7.93	7.93	10.90	10.90	10.90	10.90
	0.70	7.93	7.93	10.90	10.90	10.90	10.90
	0.75	7.93	7.93	10.90	10.90	10.90	10.90
	0.88	7.93	7.93	10.90	10.90	10.90	10.90
	1.00	7.93	7.93	10.90	10.90	10.90	10.90
$N_{R\ II,k}$ [kN]		7.93	7.93	11.34	11.34	11.34	11.34
max. head displacement "u" depending on sandwich panel thickness [mm]	30	0.7	0.7	0.7	0.7	0.7	0.7
	40	0.9	0.9	0.9	0.9	0.9	0.9
	50	1.2	1.2	1.2	1.2	1.2	1.2
	60	1.4	1.4	1.4	1.4	1.4	1.4
	70	1.6	1.6	1.6	1.6	1.6	1.6
	80	1.8	1.8	1.8	1.8	1.8	1.8
	90	2.1	2.1	2.1	2.1	2.1	2.1
	100	2.3	2.3	2.3	2.3	2.3	2.3
	110	2.5	2.5	2.5	2.5	2.5	2.5
	120	2.8	2.8	2.8	2.8	2.8	2.8
	130	3.0	3.0	3.0	3.0	3.0	3.0
	≥140	3.2	3.2	3.2	3.2	3.2	3.2

Fastening screws for sandwich panels

Self-drilling screws ESPS-12-P 6,3/5,5xL with hexagon head and washer A19, A22, A25 or A29 and saddle washer ESW

Annex 34

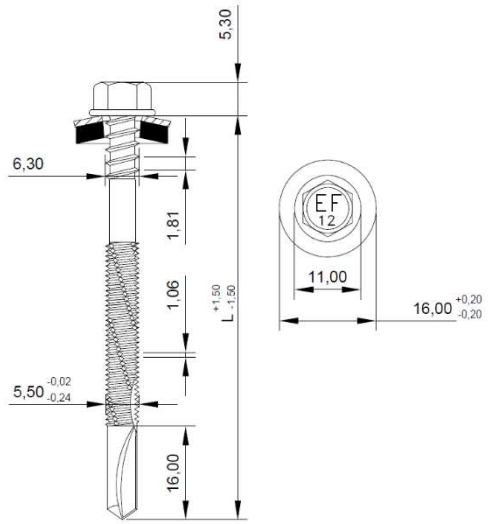
of European Technical Assessment ETA-16/0734

Materials

Fastener:	carbon steel – SAE1022, quenched, tempered and coated: galvanized with PREMIUM coating
Washer:	A16 – aluminum washer with EPDM ring
Component I:	S280GD, S320GD or S350GD – EN 10346
Component II:	S235 to S355 – EN 10025-1 S280GD, S320GD or S350GD – EN 10346

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

Timber substructures
no performance assessed



$t_{N,II}$ [mm]		4.00	5.00	6.00	8.00	10.00	11.00
$V_{R,k}$ [kN] for $t_{N,I}$ [mm]	0.40	0.84	0.84	0.84	0.84	0.84	0.84
	0.50	1.72	1.72	1.72	1.72	1.72	1.72
	0.55	1.72	1.72	1.72	1.72	1.72	1.72
	0.60	1.72	1.72	1.72	1.72	1.72	1.72
	0.63	1.90	1.90	1.90	1.90	1.90	1.90
	0.70	1.99	1.99	1.99	1.99	1.99	1.99
	0.75	2.69	2.69	2.69	2.69	2.69	2.69
	0.88	2.69	2.69	2.69	2.69	2.69	2.69
	1.00	3.10	3.10	3.10	3.10	3.10	3.10
$N_{R,k}$ [kN] for $t_{N,I}$ [mm]	0.40	1.40	1.40	1.40	1.40	1.40	1.40
	0.50	2.53	2.53	2.53	2.53	2.53	2.53
	0.55	2.53	2.53	2.53	2.53	2.53	2.53
	0.60	2.77	2.77	2.77	2.77	2.77	2.77
	0.63	2.77	2.77	2.77	2.77	2.77	2.77
	0.70	2.89	2.89	2.89	2.89	2.89	2.89
	0.75	2.89	2.89	2.89	2.89	2.89	2.89
	0.88	2.89	2.89	2.89	2.89	2.89	2.89
	1.00	4.27	4.27	4.27	4.27	4.27	4.27
$N_{R\,II,k}$ [kN]		7.93	7.93	11.34	11.34	11.34	11.34
max. head displacement "u" depending on sandwich panel thickness [mm]	30	0.7	0.7	0.7	0.7	0.7	0.7
	40	0.9	0.9	0.9	0.9	0.9	0.9
	50	1.2	1.2	1.2	1.2	1.2	1.2
	60	1.4	1.4	1.4	1.4	1.4	1.4
	70	1.6	1.6	1.6	1.6	1.6	1.6
	80	1.8	1.8	1.8	1.8	1.8	1.8
	90	2.1	2.1	2.1	2.1	2.1	2.1
	100	2.3	2.3	2.3	2.3	2.3	2.3
	110	2.5	2.5	2.5	2.5	2.5	2.5
	120	2.8	2.8	2.8	2.8	2.8	2.8
	130	3.0	3.0	3.0	3.0	3.0	3.0
	≥140	3.2	3.2	3.2	3.2	3.2	3.2

Fastening screws for sandwich panels

Self-drilling screws ESPS-12-P 6,3/5,5xL with hexagon head and washer A16

Annex 35

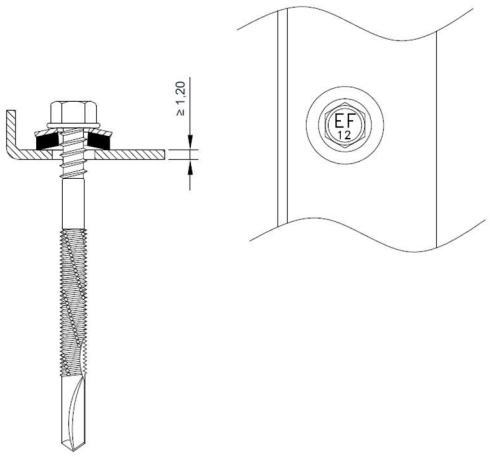
of European Technical Assessment ETA-16/0734

Materials

Fastener:	carbon steel – SAE1022, quenched, tempered and coated: galvanized with PREMIUM coating
Washer:	A16 – aluminum washer with EPDM ring
Linear washer:	ELW-Z made of carbon steel – $R_{0,2} \geq 200$ MPa and galvanized min. 200 g/m^2 ELW-S made of stainless steel A2 – EN ISO 3506
Component I:	S280GD, S320GD or S350GD – EN 10346
Component II:	S235 to S355 – EN 10025-1 S280GD, S320GD or S350GD – EN 10346

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

Timber substructures
no performance assessed



$t_{N,II}$ [mm]		4.00	5.00	6.00	8.00	10.00	11.00
$V_{R,k}$ [kN] for $t_{N,I}$ [mm]	0.40	0.84	0.84	0.84	0.84	0.84	0.84
	0.50	1.72	1.72	1.72	1.72	1.72	1.72
	0.55	1.72	1.72	1.72	1.72	1.72	1.72
	0.60	1.72	1.72	1.72	1.72	1.72	1.72
	0.63	1.90	1.90	1.90	1.90	1.90	1.90
	0.70	1.99	1.99	1.99	1.99	1.99	1.99
	0.75	2.69	2.69	2.69	2.69	2.69	2.69
	0.88	2.69	2.69	2.69	2.69	2.69	2.69
	1.00	3.10	3.10	3.10	3.10	3.10	3.10
$N_{R,k}$ [kN] for $t_{N,I}$ [mm]	0.40	7.93	7.93	11.34	11.34	11.34	11.34
	0.50	7.93	7.93	11.34	11.34	11.34	11.34
	0.55	7.93	7.93	11.34	11.34	11.34	11.34
	0.60	7.93	7.93	11.34	11.34	11.34	11.34
	0.63	7.93	7.93	11.34	11.34	11.34	11.34
	0.70	7.93	7.93	11.34	11.34	11.34	11.34
	0.75	7.93	7.93	11.34	11.34	11.34	11.34
	0.88	7.93	7.93	11.34	11.34	11.34	11.34
	1.00	7.93	7.93	11.34	11.34	11.34	11.34
$N_{R\ II,k}$ [kN]		7.93	7.93	11.34	11.34	11.34	11.34
max. head displacement "u" depending on sandwich panel thickness [mm]	30	0.7	0.7	0.7	0.7	0.7	0.7
	40	0.9	0.9	0.9	0.9	0.9	0.9
	50	1.2	1.2	1.2	1.2	1.2	1.2
	60	1.4	1.4	1.4	1.4	1.4	1.4
	70	1.6	1.6	1.6	1.6	1.6	1.6
	80	1.8	1.8	1.8	1.8	1.8	1.8
	90	2.1	2.1	2.1	2.1	2.1	2.1
	100	2.3	2.3	2.3	2.3	2.3	2.3
	110	2.5	2.5	2.5	2.5	2.5	2.5
	120	2.8	2.8	2.8	2.8	2.8	2.8
	130	3.0	3.0	3.0	3.0	3.0	3.0
	≥140	3.2	3.2	3.2	3.2	3.2	3.2

Fastening screws for sandwich panels

Self-drilling screws ESPS-12-P 6,3/5,5xL with hexagon head, washer A16 and linear washer ELW-Z or ELW-S

Annex 36

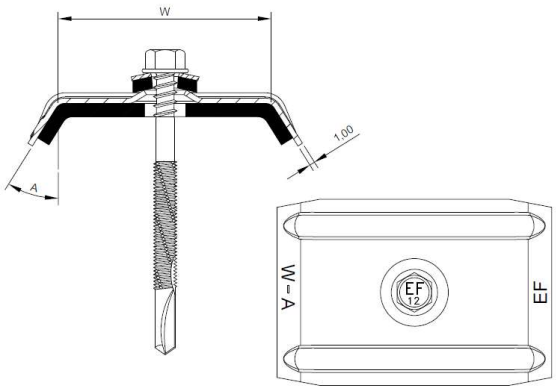
of European Technical Assessment ETA-16/0734

Materials

Fastener:	carbon steel – SAE1022, quenched, tempered and coated: galvanized with PREMIUM coating
Washer:	A16 – aluminum washer with EPDM ring
Saddle washer:	ESW made of aluminum
Component I:	S280GD, S320GD or S350GD – EN 10346
Component II:	S235 to S355 – EN 10025-1 S280GD, S320GD or S350GD – EN 10346

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

Timber substructures
no performance assessed



$t_{N,II}$ [mm]		4.00	5.00	6.00	8.00	10.00	11.00
$V_{R,k}$ [kN] for $t_{N,I}$ [mm]	0.40	0.84	0.84	0.84	0.84	0.84	0.84
	0.50	1.72	1.72	1.72	1.72	1.72	1.72
	0.55	1.72	1.72	1.72	1.72	1.72	1.72
	0.60	1.72	1.72	1.72	1.72	1.72	1.72
	0.63	1.90	1.90	1.90	1.90	1.90	1.90
	0.70	1.99	1.99	1.99	1.99	1.99	1.99
	0.75	2.69	2.69	2.69	2.69	2.69	2.69
	0.88	2.69	2.69	2.69	2.69	2.69	2.69
	1.00	3.10	3.10	3.10	3.10	3.10	3.10
$N_{R,k}$ [kN] for $t_{N,I}$ [mm]	0.40	7.93	7.93	10.53	10.53	10.53	10.53
	0.50	7.93	7.93	10.92	10.92	10.92	10.92
	0.55	7.93	7.93	10.92	10.92	10.92	10.92
	0.60	7.93	7.93	10.92	10.92	10.92	10.92
	0.63	7.93	7.93	10.92	10.92	10.92	10.92
	0.70	7.93	7.93	10.92	10.92	10.92	10.92
	0.75	7.93	7.93	10.92	10.92	10.92	10.92
	0.88	7.93	7.93	10.92	10.92	10.92	10.92
	1.00	7.93	7.93	10.92	10.92	10.92	10.92
$N_{R\ II,k}$ [kN]		7.93	7.93	11.34	11.34	11.34	11.34
max. head displacement "u" depending on sandwich panel thickness [mm]	30	0.7	0.7	0.7	0.7	0.7	0.7
	40	0.9	0.9	0.9	0.9	0.9	0.9
	50	1.2	1.2	1.2	1.2	1.2	1.2
	60	1.4	1.4	1.4	1.4	1.4	1.4
	70	1.6	1.6	1.6	1.6	1.6	1.6
	80	1.8	1.8	1.8	1.8	1.8	1.8
	90	2.1	2.1	2.1	2.1	2.1	2.1
	100	2.3	2.3	2.3	2.3	2.3	2.3
	110	2.5	2.5	2.5	2.5	2.5	2.5
	120	2.8	2.8	2.8	2.8	2.8	2.8
	130	3.0	3.0	3.0	3.0	3.0	3.0
	≥140	3.2	3.2	3.2	3.2	3.2	3.2

Fastening screws for sandwich panels

Self-drilling screws ESPS-12-P 6,3/5,5xL with hexagon head, washer A16 and saddle washer ESW

Annex 37

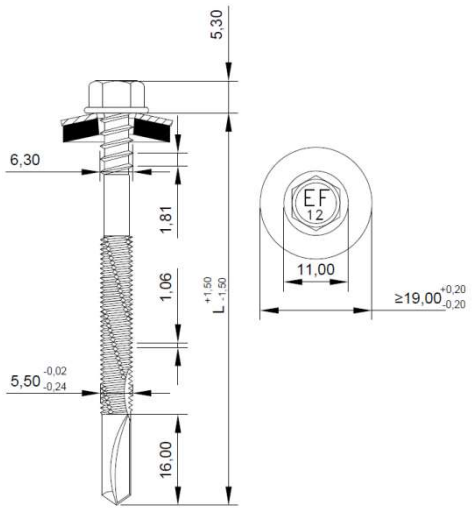
of European Technical Assessment ETA-16/0734

Materials

Fastener:	carbon steel – SAE1022, quenched, tempered and coated: galvanized with SUPER PREMIUM coating
Washer:	S19, S22, S25, S29 – stainless steel washer with EPDM ring or A19, A22, A25, A29 – aluminum washer with EPDM ring
Component I:	S280GD, S320GD or S350GD – EN 10346
Component II:	S235 to S355 – EN 10025-1 S280GD, S320GD or S350GD – EN 10346

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

Timber substructures
no performance assessed



$t_{N,II}$ [mm]		4.00	5.00	6.00	8.00	10.00	11.00
$V_{R,k}$ [kN] for $t_{N,I}$ [mm]	0.40	0.84	0.84	0.84	0.84	0.84	0.84
	0.50	1.72	1.72	1.72	1.72	1.72	1.72
	0.55	1.72	1.72	1.72	1.72	1.72	1.72
	0.60	1.72	1.72	1.72	1.72	1.72	1.72
	0.63	1.90	1.90	1.90	1.90	1.90	1.90
	0.70	1.99	1.99	1.99	1.99	1.99	1.99
	0.75	2.69	2.69	2.69	2.69	2.69	2.69
	0.88	2.69	2.69	2.69	2.69	2.69	2.69
	1.00	3.10	3.10	3.10	3.10	3.10	3.10
$N_{R,k}$ [kN] for $t_{N,I}$ [mm]	0.40	1.81	1.81	1.81	1.81	1.81	1.81
	0.50	4.14	4.14	4.14	4.14	4.14	4.14
	0.55	4.14	4.14	4.14	4.14	4.14	4.14
	0.60	4.14	4.14	4.14	4.14	4.14	4.14
	0.63	5.10	5.10	5.10	5.10	5.10	5.10
	0.70	5.50	5.50	5.50	5.50	5.50	5.50
	0.75	7.70	7.70	7.70	7.70	7.70	7.70
	0.88	7.70	7.70	7.70	7.70	7.70	7.70
	1.00	7.78	7.78	7.78	7.78	7.78	7.78
$N_{R\ II,k}$ [kN]		7.93	7.93	11.34	11.34	11.34	11.34
max. head displacement "u" depending on sandwich panel thickness [mm]	30	0.7	0.7	0.7	0.7	0.7	0.7
	40	0.9	0.9	0.9	0.9	0.9	0.9
	50	1.2	1.2	1.2	1.2	1.2	1.2
	60	1.4	1.4	1.4	1.4	1.4	1.4
	70	1.6	1.6	1.6	1.6	1.6	1.6
	80	1.8	1.8	1.8	1.8	1.8	1.8
	90	2.1	2.1	2.1	2.1	2.1	2.1
	100	2.3	2.3	2.3	2.3	2.3	2.3
	110	2.5	2.5	2.5	2.5	2.5	2.5
	120	2.8	2.8	2.8	2.8	2.8	2.8
	130	3.0	3.0	3.0	3.0	3.0	3.0
	≥140	3.2	3.2	3.2	3.2	3.2	3.2

Fastening screws for sandwich panels

Self-drilling screws ESPS-12-SP 6,3/5,5xL with hexagon head and washer S19, S22, S25, S29, A19, A22, A25 or A29

Annex 38

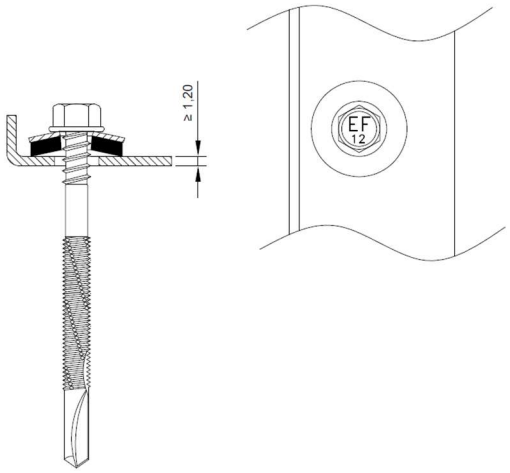
of European Technical Assessment ETA-16/0734

Materials

Fastener:	carbon steel – SAE1022, quenched, tempered and coated: galvanized with SUPER PREMIUM coating
Washer:	S19, S22, S25, S29 – stainless steel washer with EPDM ring or A19, A22, A25, A29 – aluminum washer with EPDM ring
Linear washer:	ELW-Z made of carbon steel – $R_{0,2} \geq 200$ MPa and galvanized min. 200 g/m^2 ELW-S made of stainless steel A2 – EN ISO 3506
Component I:	S280GD, S320GD or S350GD – EN 10346
Component II:	S235 to S355 – EN 10025-1 S280GD, S320GD or S350GD – EN 10346

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

Timber substructures
no performance assessed



$t_{N,II}$ [mm]		4.00	5.00	6.00	8.00	10.00	11.00
$V_{R,k}$ [kN] for $t_{N,I}$ [mm]	0.40	0.84	0.84	0.84	0.84	0.84	0.84
	0.50	1.72	1.72	1.72	1.72	1.72	1.72
	0.55	1.72	1.72	1.72	1.72	1.72	1.72
	0.60	1.72	1.72	1.72	1.72	1.72	1.72
	0.63	1.90	1.90	1.90	1.90	1.90	1.90
	0.70	1.99	1.99	1.99	1.99	1.99	1.99
	0.75	2.69	2.69	2.69	2.69	2.69	2.69
	0.88	2.69	2.69	2.69	2.69	2.69	2.69
	1.00	3.10	3.10	3.10	3.10	3.10	3.10
$N_{R,k}$ [kN] for $t_{N,I}$ [mm]	0.40	7.78	7.78	7.78	7.78	7.78	7.78
	0.50	7.78	7.78	7.78	7.78	7.78	7.78
	0.55	7.78	7.78	7.78	7.78	7.78	7.78
	0.60	7.78	7.78	7.78	7.78	7.78	7.78
	0.63	7.78	7.78	7.78	7.78	7.78	7.78
	0.70	7.78	7.78	7.78	7.78	7.78	7.78
	0.75	7.78	7.78	7.78	7.78	7.78	7.78
	0.88	7.78	7.78	7.78	7.78	7.78	7.78
	1.00	7.78	7.78	7.78	7.78	7.78	7.78
$N_{R\,II,k}$ [kN]		7.93	7.93	11.34	11.34	11.34	11.34
max. head displacement "u" depending on sandwich panel thickness [mm]	30	0.7	0.7	0.7	0.7	0.7	0.7
	40	0.9	0.9	0.9	0.9	0.9	0.9
	50	1.2	1.2	1.2	1.2	1.2	1.2
	60	1.4	1.4	1.4	1.4	1.4	1.4
	70	1.6	1.6	1.6	1.6	1.6	1.6
	80	1.8	1.8	1.8	1.8	1.8	1.8
	90	2.1	2.1	2.1	2.1	2.1	2.1
	100	2.3	2.3	2.3	2.3	2.3	2.3
	110	2.5	2.5	2.5	2.5	2.5	2.5
	120	2.8	2.8	2.8	2.8	2.8	2.8
	130	3.0	3.0	3.0	3.0	3.0	3.0
	≥140	3.2	3.2	3.2	3.2	3.2	3.2

Fastening screws for sandwich panels

Self-drilling screws ESPS-12-SP 6,3/5,5xL with hexagon head, washer S19, S22, S25, S29, A19, A22, A25 or A29 and linear washer ELW-Z or ELW-S

Annex 39

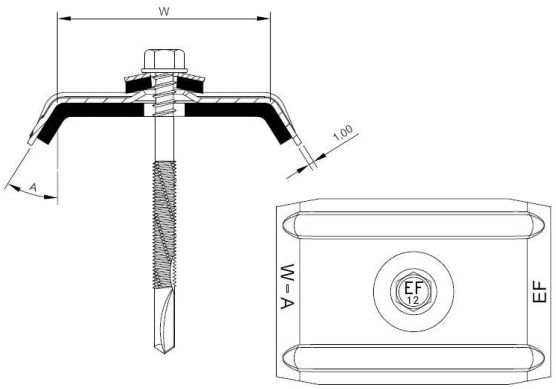
of European Technical Assessment ETA-16/0734

Materials

Fastener:	carbon steel – SAE1022, quenched, tempered and coated: galvanized with SUPER PREMIUM coating
Washer:	S19, S22, S25, S29 – stainless steel washer with EPDM ring or A19, A22, A25, A29 – aluminum washer with EPDM ring
Saddle washer:	ESW made of aluminum
Component I:	S280GD, S320GD or S350GD – EN 10346
Component II:	S235 to S355 – EN 10025-1 S280GD, S320GD or S350GD – EN 10346

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

Timber substructures
no performance assessed



$t_{N,II}$ [mm]		4.00	5.00	6.00	8.00	10.00	11.00
$V_{R,k}$ [kN] for $t_{N,I}$ [mm]	0.40	0.84	0.84	0.84	0.84	0.84	0.84
	0.50	1.72	1.72	1.72	1.72	1.72	1.72
	0.55	1.72	1.72	1.72	1.72	1.72	1.72
	0.60	1.72	1.72	1.72	1.72	1.72	1.72
	0.63	1.90	1.90	1.90	1.90	1.90	1.90
	0.70	1.99	1.99	1.99	1.99	1.99	1.99
	0.75	2.69	2.69	2.69	2.69	2.69	2.69
	0.88	2.69	2.69	2.69	2.69	2.69	2.69
	1.00	3.10	3.10	3.10	3.10	3.10	3.10
$N_{R,k}$ [kN] for $t_{N,I}$ [mm]	0.40	7.93	7.93	10.14	10.14	10.14	10.14
	0.50	7.93	7.93	10.90	10.90	10.90	10.90
	0.55	7.93	7.93	10.90	10.90	10.90	10.90
	0.60	7.93	7.93	10.90	10.90	10.90	10.90
	0.63	7.93	7.93	10.90	10.90	10.90	10.90
	0.70	7.93	7.93	10.90	10.90	10.90	10.90
	0.75	7.93	7.93	10.90	10.90	10.90	10.90
	0.88	7.93	7.93	10.90	10.90	10.90	10.90
	1.00	7.93	7.93	10.90	10.90	10.90	10.90
$N_{R\,II,k}$ [kN]		7.93	7.93	11.34	11.34	11.34	11.34
max. head displacement "u" depending on sandwich panel thickness [mm]	30	0.7	0.7	0.7	0.7	0.7	0.7
	40	0.9	0.9	0.9	0.9	0.9	0.9
	50	1.2	1.2	1.2	1.2	1.2	1.2
	60	1.4	1.4	1.4	1.4	1.4	1.4
	70	1.6	1.6	1.6	1.6	1.6	1.6
	80	1.8	1.8	1.8	1.8	1.8	1.8
	90	2.1	2.1	2.1	2.1	2.1	2.1
	100	2.3	2.3	2.3	2.3	2.3	2.3
	110	2.5	2.5	2.5	2.5	2.5	2.5
	120	2.8	2.8	2.8	2.8	2.8	2.8
	130	3.0	3.0	3.0	3.0	3.0	3.0
	≥140	3.2	3.2	3.2	3.2	3.2	3.2

Fastening screws for sandwich panels

Self-drilling screws ESPS-12-SP 6,3/5,5xL with hexagon head, washer S19, S22, S25, S29, A19, A22, A25 or A29 and saddle washer ESW

Annex 40

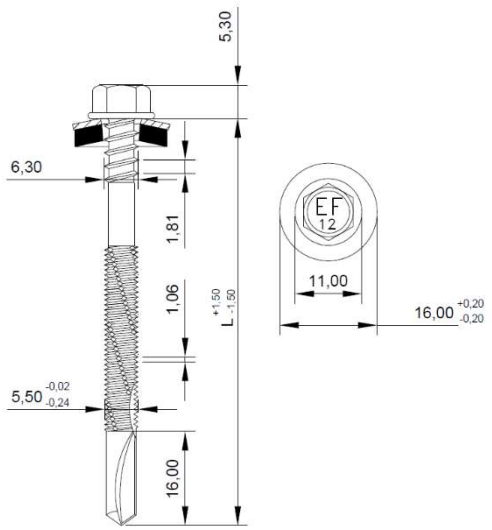
of European Technical Assessment ETA-16/0734

Materials

Fastener:	carbon steel – SAE1022, quenched, tempered and coated: galvanized with SUPER PREMIUM coating
Washer:	S16 – stainless steel washer with EPDM ring or A16 – aluminum washer with EPDM ring
Component I:	S280GD, S320GD or S350GD – EN 10346
Component II:	S235 to S355 – EN 10025-1 S280GD, S320GD or S350GD – EN 10346

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

Timber substructures
no performance assessed



$t_{N,II}$ [mm]		4.00	5.00	6.00	8.00	10.00	11.00
$V_{R,k}$ [kN] for $t_{N,I}$ [mm]	0.40	0.84	0.84	0.84	0.84	0.84	0.84
	0.50	1.72	1.72	1.72	1.72	1.72	1.72
	0.55	1.72	1.72	1.72	1.72	1.72	1.72
	0.60	1.72	1.72	1.72	1.72	1.72	1.72
	0.63	1.90	1.90	1.90	1.90	1.90	1.90
	0.70	1.99	1.99	1.99	1.99	1.99	1.99
	0.75	2.69	2.69	2.69	2.69	2.69	2.69
	0.88	2.69	2.69	2.69	2.69	2.69	2.69
	1.00	3.10	3.10	3.10	3.10	3.10	3.10
$N_{R,k}$ [kN] for $t_{N,I}$ [mm]	0.40	1.40	1.40	1.40	1.40	1.40	1.40
	0.50	2.53	2.53	2.53	2.53	2.53	2.53
	0.55	2.53	2.53	2.53	2.53	2.53	2.53
	0.60	2.77	2.77	2.77	2.77	2.77	2.77
	0.63	2.77	2.77	2.77	2.77	2.77	2.77
	0.70	2.89	2.89	2.89	2.89	2.89	2.89
	0.75	2.89	2.89	2.89	2.89	2.89	2.89
	0.88	2.89	2.89	2.89	2.89	2.89	2.89
	1.00	4.27	4.27	4.27	4.27	4.27	4.27
$N_{R\ II,k}$ [kN]		7.93	7.93	11.34	11.34	11.34	11.34
max. head displacement "u" depending on sandwich panel thickness [mm]	30	0.7	0.7	0.7	0.7	0.7	0.7
	40	0.9	0.9	0.9	0.9	0.9	0.9
	50	1.2	1.2	1.2	1.2	1.2	1.2
	60	1.4	1.4	1.4	1.4	1.4	1.4
	70	1.6	1.6	1.6	1.6	1.6	1.6
	80	1.8	1.8	1.8	1.8	1.8	1.8
	90	2.1	2.1	2.1	2.1	2.1	2.1
	100	2.3	2.3	2.3	2.3	2.3	2.3
	110	2.5	2.5	2.5	2.5	2.5	2.5
	120	2.8	2.8	2.8	2.8	2.8	2.8
	130	3.0	3.0	3.0	3.0	3.0	3.0
	≥140	3.2	3.2	3.2	3.2	3.2	3.2

Fastening screws for sandwich panels

Self-drilling screws ESPS-12-SP 6,3/5,5xL with hexagon head and washer S16 or A16

Annex 41

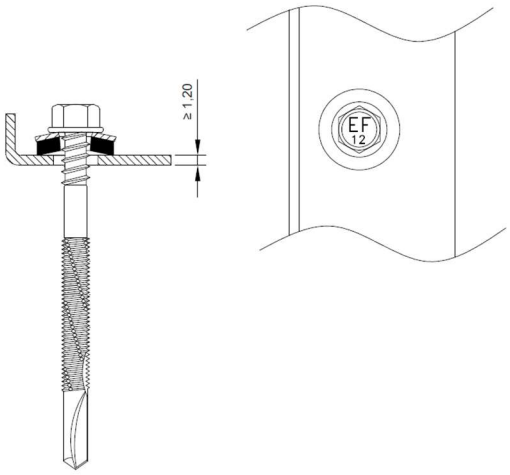
of European Technical Assessment ETA-16/0734

Materials

Fastener:	carbon steel – SAE1022, quenched, tempered and coated: galvanized with SUPER PREMIUM coating
Washer:	S16 – stainless steel washer with EPDM ring or A16 – aluminum washer with EPDM ring
Linear washer:	ELW-Z made of carbon steel – $R_{0,2} \geq 200$ MPa and galvanized min. 200 g/m^2 ELW-S made of stainless steel A2 – EN ISO 3506
Component I:	S280GD, S320GD or S350GD – EN 10346
Component II:	S235 to S355 – EN 10025-1 S280GD, S320GD or S350GD – EN 10346

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

Timber substructures
no performance assessed



$t_{N,II}$ [mm]		4.00	5.00	6.00	8.00	10.00	11.00
$V_{R,k}$ [kN] for $t_{N,I}$ [mm]	0.40	0.84	0.84	0.84	0.84	0.84	0.84
	0.50	1.72	1.72	1.72	1.72	1.72	1.72
	0.55	1.72	1.72	1.72	1.72	1.72	1.72
	0.60	1.72	1.72	1.72	1.72	1.72	1.72
	0.63	1.90	1.90	1.90	1.90	1.90	1.90
	0.70	1.99	1.99	1.99	1.99	1.99	1.99
	0.75	2.69	2.69	2.69	2.69	2.69	2.69
	0.88	2.69	2.69	2.69	2.69	2.69	2.69
	1.00	3.10	3.10	3.10	3.10	3.10	3.10
$N_{R,k}$ [kN] for $t_{N,I}$ [mm]	0.40	7.93	7.93	11.34	11.34	11.34	11.34
	0.50	7.93	7.93	11.34	11.34	11.34	11.34
	0.55	7.93	7.93	11.34	11.34	11.34	11.34
	0.60	7.93	7.93	11.34	11.34	11.34	11.34
	0.63	7.93	7.93	11.34	11.34	11.34	11.34
	0.70	7.93	7.93	11.34	11.34	11.34	11.34
	0.75	7.93	7.93	11.34	11.34	11.34	11.34
	0.88	7.93	7.93	11.34	11.34	11.34	11.34
	1.00	7.93	7.93	11.34	11.34	11.34	11.34
$N_{R\,II,k}$ [kN]		7.93	7.93	11.34	11.34	11.34	11.34
max. head displacement "u" depending on sandwich panel thickness [mm]	30	0.7	0.7	0.7	0.7	0.7	0.7
	40	0.9	0.9	0.9	0.9	0.9	0.9
	50	1.2	1.2	1.2	1.2	1.2	1.2
	60	1.4	1.4	1.4	1.4	1.4	1.4
	70	1.6	1.6	1.6	1.6	1.6	1.6
	80	1.8	1.8	1.8	1.8	1.8	1.8
	90	2.1	2.1	2.1	2.1	2.1	2.1
	100	2.3	2.3	2.3	2.3	2.3	2.3
	110	2.5	2.5	2.5	2.5	2.5	2.5
	120	2.8	2.8	2.8	2.8	2.8	2.8
	130	3.0	3.0	3.0	3.0	3.0	3.0
	≥140	3.2	3.2	3.2	3.2	3.2	3.2

Fastening screws for sandwich panels

Self-drilling screws ESPS-12-SP 6,3/5,5xL with hexagon head, washer S16 or A16 and linear washer ELW-Z or ELW-S

Annex 42

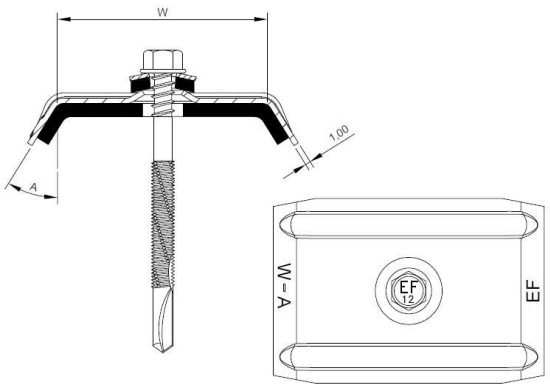
of European Technical Assessment ETA-16/0734

Materials

Fastener:	carbon steel – SAE1022, quenched, tempered and coated: galvanized with SUPER PREMIUM coating
Washer:	S16 – stainless steel washer with EPDM ring or A16 – aluminum washer with EPDM ring
Saddle washer:	ESW made of aluminum
Component I:	S280GD, S320GD or S350GD – EN 10346
Component II:	S235 to S355 – EN 10025-1 S280GD, S320GD or S350GD – EN 10346

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

Timber substructures
no performance assessed



$t_{N,II}$ [mm]		4.00	5.00	6.00	8.00	10.00	11.00
$V_{R,k}$ [kN] for $t_{N,I}$ [mm]	0.40	0.84	0.84	0.84	0.84	0.84	0.84
	0.50	1.72	1.72	1.72	1.72	1.72	1.72
	0.55	1.72	1.72	1.72	1.72	1.72	1.72
	0.60	1.72	1.72	1.72	1.72	1.72	1.72
	0.63	1.90	1.90	1.90	1.90	1.90	1.90
	0.70	1.99	1.99	1.99	1.99	1.99	1.99
	0.75	2.69	2.69	2.69	2.69	2.69	2.69
	0.88	2.69	2.69	2.69	2.69	2.69	2.69
	1.00	3.10	3.10	3.10	3.10	3.10	3.10
$N_{R,k}$ [kN] for $t_{N,I}$ [mm]	0.40	7.93	7.93	10.53	10.53	10.53	10.53
	0.50	7.93	7.93	10.92	10.92	10.92	10.92
	0.55	7.93	7.93	10.92	10.92	10.92	10.92
	0.60	7.93	7.93	10.92	10.92	10.92	10.92
	0.63	7.93	7.93	10.92	10.92	10.92	10.92
	0.70	7.93	7.93	10.92	10.92	10.92	10.92
	0.75	7.93	7.93	10.92	10.92	10.92	10.92
	0.88	7.93	7.93	10.92	10.92	10.92	10.92
	1.00	7.93	7.93	10.92	10.92	10.92	10.92
$N_{R\ II,k}$ [kN]		7.93	7.93	11.34	11.34	11.34	11.34
max. head displacement "u" depending on sandwich panel thickness [mm]	30	0.7	0.7	0.7	0.7	0.7	0.7
	40	0.9	0.9	0.9	0.9	0.9	0.9
	50	1.2	1.2	1.2	1.2	1.2	1.2
	60	1.4	1.4	1.4	1.4	1.4	1.4
	70	1.6	1.6	1.6	1.6	1.6	1.6
	80	1.8	1.8	1.8	1.8	1.8	1.8
	90	2.1	2.1	2.1	2.1	2.1	2.1
	100	2.3	2.3	2.3	2.3	2.3	2.3
	110	2.5	2.5	2.5	2.5	2.5	2.5
	120	2.8	2.8	2.8	2.8	2.8	2.8
	130	3.0	3.0	3.0	3.0	3.0	3.0
	≥140	3.2	3.2	3.2	3.2	3.2	3.2

Fastening screws for sandwich panels

Self-drilling screws ESPS-12-SP 6,3/5,5xL with hexagon head, washer S16 or A16 and saddle washer ESW

Annex 43

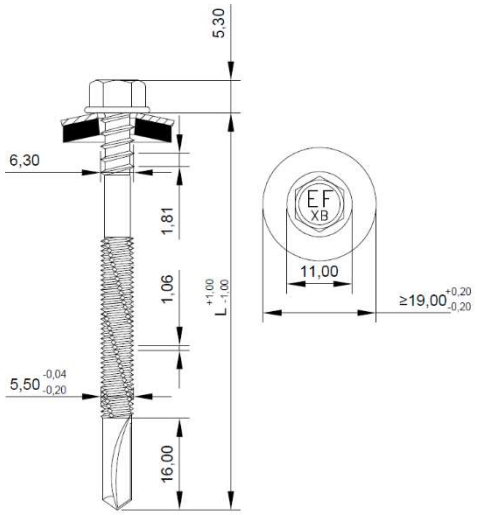
of European Technical Assessment ETA-16/0734

Materials

Fastener:	stainless steel – SAE304 (bi-metal)
Washer:	S19, S22, S25, S29 – stainless steel washer with EPDM ring
Component I:	S280GD, S320GD or S350GD – EN 10346
Component II:	S235 to S355 – EN 10025-1 S280GD, S320GD or S350GD – EN 10346

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

Timber substructures
no performance assessed



$t_{N,II}$ [mm]		4.00	5.00	6.00	8.00	10.00	11.00
$V_{R,k}$ [kN] for $t_{N,I}$ [mm]	0.40	1.07	1.07	1.07	1.07	1.07	1.07
	0.50	1.39	1.39	1.39	1.39	1.39	1.39
	0.55	1.39	1.39	1.39	1.39	1.39	1.39
	0.60	1.39	1.39	1.39	1.39	1.39	1.39
	0.63	1.39	1.39	1.39	1.39	1.39	1.39
	0.70	1.83	1.83	1.83	1.83	1.83	1.83
	0.75	1.83	1.83	1.83	1.83	1.83	1.83
	0.88	1.83	1.83	1.83	1.83	1.83	1.83
	1.00	2.73	2.73	2.73	2.73	2.73	2.73
$N_{R,k}$ [kN] for $t_{N,I}$ [mm]	0.40	2.90	2.90	2.90	2.90	2.90	2.90
	0.50	4.16	4.16	4.16	4.16	4.16	4.16
	0.55	4.16	4.16	4.16	4.16	4.16	4.16
	0.60	4.16	4.16	4.16	4.16	4.16	4.16
	0.63	4.16	4.16	4.16	4.16	4.16	4.16
	0.70	5.17	5.17	5.71	5.71	5.71	5.71
	0.75	5.17	5.17	5.71	5.71	5.71	5.71
	0.88	5.17	5.17	5.71	5.71	5.71	5.71
	1.00	5.17	5.17	7.12	7.12	7.12	7.12
$N_{R\,II,k}$ [kN]		5.17	5.17	7.45	7.45	7.45	7.45
max. head displacement "u" depending on sandwich panel thickness [mm]	30	2.3	2.1	2.1	2.1	2.1	2.1
	40	3.0	2.8	2.8	2.8	2.8	2.8
	50	3.8	3.5	3.5	3.5	3.5	3.5
	60	4.5	4.2	4.2	4.2	4.2	4.2
	70	5.3	4.9	4.9	4.9	4.9	4.9
	80	6.0	5.6	5.6	5.6	5.6	5.6
	90	6.8	6.3	6.3	6.3	6.3	6.3
	100	7.5	7.0	7.0	7.0	7.0	7.0
	110	8.3	7.7	7.7	7.7	7.7	7.7
	120	9.0	8.4	8.4	8.4	8.4	8.4
	130	9.8	9.1	9.1	9.1	9.1	9.1
	≥140	10.5	9.8	9.8	9.8	9.8	9.8

Fastening screws for sandwich panels

Self-drilling screws ESPS-12-B 6,3/5,5xL with hexagon head and washer S19, S22, S25 or S29

Annex 44

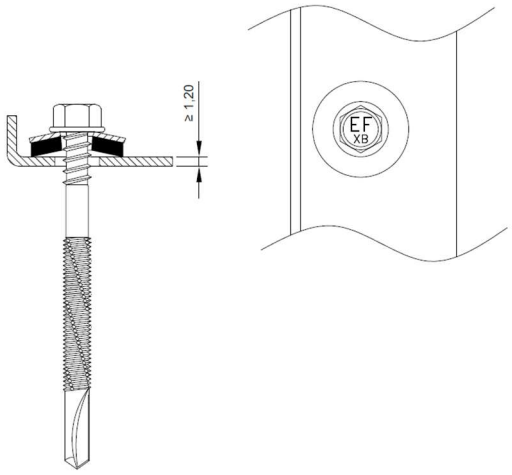
of European Technical Assessment ETA-16/0734

Materials

Fastener:	stainless steel – SAE304 (bi-metal)
Washer:	S19, S22, S25, S29 – stainless steel washer with EPDM ring
Linear washer:	ELW-S made of stainless steel A2 – EN ISO 3506
Component I:	S280GD, S320GD or S350GD – EN 10346
Component II:	S235 to S355 – EN 10025-1 S280GD, S320GD or S350GD – EN 10346

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

Timber substructures
no performance assessed



$t_{N,II}$ [mm]		4.00	5.00	6.00	8.00	10.00	11.00
$V_{R,k}$ [kN] for $t_{N,I}$ [mm]	0.40	1.07	1.07	1.07	1.07	1.07	1.07
	0.50	1.39	1.39	1.39	1.39	1.39	1.39
	0.55	1.39	1.39	1.39	1.39	1.39	1.39
	0.60	1.39	1.39	1.39	1.39	1.39	1.39
	0.63	1.39	1.39	1.39	1.39	1.39	1.39
	0.70	1.83	1.83	1.83	1.83	1.83	1.83
	0.75	1.83	1.83	1.83	1.83	1.83	1.83
	0.88	1.83	1.83	1.83	1.83	1.83	1.83
	1.00	2.73	2.73	2.73	2.73	2.73	2.73
$N_{R,k}$ [kN] for $t_{N,I}$ [mm]	0.40	5.17	5.17	7.45	7.45	7.45	7.45
	0.50	5.17	5.17	7.45	7.45	7.45	7.45
	0.55	5.17	5.17	7.45	7.45	7.45	7.45
	0.60	5.17	5.17	7.45	7.45	7.45	7.45
	0.63	5.17	5.17	7.45	7.45	7.45	7.45
	0.70	5.17	5.17	7.45	7.45	7.45	7.45
	0.75	5.17	5.17	7.45	7.45	7.45	7.45
	0.88	5.17	5.17	7.45	7.45	7.45	7.45
	1.00	5.17	5.17	7.45	7.45	7.45	7.45
$N_{R\,II,k}$ [kN]		5.17	5.17	7.45	7.45	7.45	7.45
max. head displacement "u" depending on sandwich panel thickness [mm]	30	2.3	2.1	2.1	2.1	2.1	2.1
	40	3.0	2.8	2.8	2.8	2.8	2.8
	50	3.8	3.5	3.5	3.5	3.5	3.5
	60	4.5	4.2	4.2	4.2	4.2	4.2
	70	5.3	4.9	4.9	4.9	4.9	4.9
	80	6.0	5.6	5.6	5.6	5.6	5.6
	90	6.8	6.3	6.3	6.3	6.3	6.3
	100	7.5	7.0	7.0	7.0	7.0	7.0
	110	8.3	7.7	7.7	7.7	7.7	7.7
	120	9.0	8.4	8.4	8.4	8.4	8.4
	130	9.8	9.1	9.1	9.1	9.1	9.1
	≥140	10.5	9.8	9.8	9.8	9.8	9.8

Fastening screws for sandwich panels

Self-drilling screws ESPS-12-B 6,3/5,5xL with hexagon head, washer S19, S22, S25 or S29 and linear washer ELW-S

Annex 45

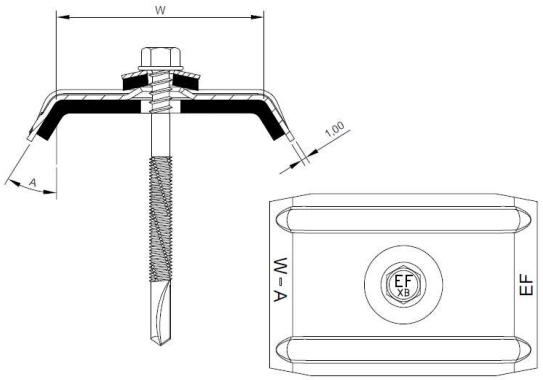
of European Technical Assessment ETA-16/0734

Materials

Fastener:	stainless steel – SAE304 (bi-metal)
Washer:	S19, S22, S25, S29 – stainless steel washer with EPDM ring
Saddle washer:	ESW made of aluminum
Component I:	S280GD, S320GD or S350GD – EN 10346
Component II:	S235 to S355 – EN 10025-1 S280GD, S320GD or S350GD – EN 10346

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

Timber substructures
no performance assessed



$t_{N,II}$ [mm]		4.00	5.00	6.00	8.00	10.00	11.00
$V_{R,k}$ [kN] for $t_{N,I}$ [mm]	0.40	1.07	1.07	1.07	1.07	1.07	1.07
	0.50	1.39	1.39	1.39	1.39	1.39	1.39
	0.55	1.39	1.39	1.39	1.39	1.39	1.39
	0.60	1.39	1.39	1.39	1.39	1.39	1.39
	0.63	1.39	1.39	1.39	1.39	1.39	1.39
	0.70	1.83	1.83	1.83	1.83	1.83	1.83
	0.75	1.83	1.83	1.83	1.83	1.83	1.83
	0.88	1.83	1.83	1.83	1.83	1.83	1.83
	1.00	2.73	2.73	2.73	2.73	2.73	2.73
$N_{R,k}$ [kN] for $t_{N,I}$ [mm]	0.40	5.17	5.17	7.45	7.45	7.45	7.45
	0.50	5.17	5.17	7.45	7.45	7.45	7.45
	0.55	5.17	5.17	7.45	7.45	7.45	7.45
	0.60	5.17	5.17	7.45	7.45	7.45	7.45
	0.63	5.17	5.17	7.45	7.45	7.45	7.45
	0.70	5.17	5.17	7.45	7.45	7.45	7.45
	0.75	5.17	5.17	7.45	7.45	7.45	7.45
	0.88	5.17	5.17	7.45	7.45	7.45	7.45
	1.00	5.17	5.17	7.45	7.45	7.45	7.45
$N_{R\,II,k}$ [kN]		5.17	5.17	7.45	7.45	7.45	7.45
max. head displacement "u" depending on sandwich panel thickness [mm]	30	2.3	2.1	2.1	2.1	2.1	2.1
	40	3.0	2.8	2.8	2.8	2.8	2.8
	50	3.8	3.5	3.5	3.5	3.5	3.5
	60	4.5	4.2	4.2	4.2	4.2	4.2
	70	5.3	4.9	4.9	4.9	4.9	4.9
	80	6.0	5.6	5.6	5.6	5.6	5.6
	90	6.8	6.3	6.3	6.3	6.3	6.3
	100	7.5	7.0	7.0	7.0	7.0	7.0
	110	8.3	7.7	7.7	7.7	7.7	7.7
	120	9.0	8.4	8.4	8.4	8.4	8.4
	130	9.8	9.1	9.1	9.1	9.1	9.1
	≥140	10.5	9.8	9.8	9.8	9.8	9.8

Fastening screws for sandwich panels

Self-drilling screws ESPS-12-B 6,3/5,5xL with hexagon head, washer S19, S22, S25 or S29 and saddle washer ESW

Annex 46

of European Technical Assessment ETA-16/0734

Materials

Fastener: stainless steel – SAE304 (bi-metal)

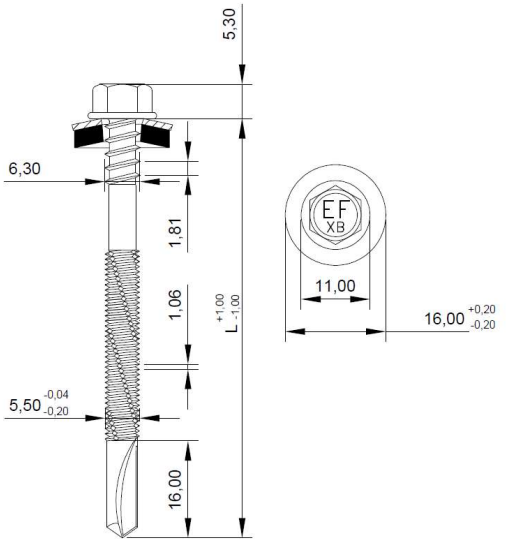
Washer: S16 – stainless steel washer with EPDM ring

Component I: S280GD, S320GD or S350GD – EN 10346

Component II: S235 to S355 – EN 10025-1
S280GD, S320GD or S350GD – EN 10346

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

Timber substructures
no performance assessed



$t_{N,II}$ [mm]		4.00	5.00	6.00	8.00	10.00	11.00
$V_{R,k}$ [kN] for $t_{N,I}$ [mm]	0.40	1.07	1.07	1.07	1.07	1.07	1.07
	0.50	1.39	1.39	1.39	1.39	1.39	1.39
	0.55	1.39	1.39	1.39	1.39	1.39	1.39
	0.60	1.39	1.39	1.39	1.39	1.39	1.39
	0.63	1.39	1.39	1.39	1.39	1.39	1.39
	0.70	1.83	1.83	1.83	1.83	1.83	1.83
	0.75	1.83	1.83	1.83	1.83	1.83	1.83
	0.88	1.83	1.83	1.83	1.83	1.83	1.83
	1.00	2.73	2.73	2.73	2.73	2.73	2.73
$N_{R,k}$ [kN] for $t_{N,I}$ [mm]	0.40	1.43	1.43	1.43	1.43	1.43	1.43
	0.50	2.39	2.39	2.39	2.39	2.39	2.39
	0.55	2.39	2.39	2.39	2.39	2.39	2.39
	0.60	2.87	2.87	2.87	2.87	2.87	2.87
	0.63	2.87	2.87	2.87	2.87	2.87	2.87
	0.70	3.16	3.16	3.16	3.16	3.16	3.16
	0.75	3.16	3.16	3.16	3.16	3.16	3.16
	0.88	3.16	3.16	3.16	3.16	3.16	3.16
	1.00	4.34	4.34	4.34	4.34	4.34	4.34
$N_{R\,II,k}$ [kN]		5.17	5.17	7.45	7.45	7.45	7.45
max. head displacement "u" depending on sandwich panel thickness [mm]	30	2.3	2.1	2.1	2.1	2.1	2.1
	40	3.0	2.8	2.8	2.8	2.8	2.8
	50	3.8	3.5	3.5	3.5	3.5	3.5
	60	4.5	4.2	4.2	4.2	4.2	4.2
	70	5.3	4.9	4.9	4.9	4.9	4.9
	80	6.0	5.6	5.6	5.6	5.6	5.6
	90	6.8	6.3	6.3	6.3	6.3	6.3
	100	7.5	7.0	7.0	7.0	7.0	7.0
	110	8.3	7.7	7.7	7.7	7.7	7.7
	120	9.0	8.4	8.4	8.4	8.4	8.4
	130	9.8	9.1	9.1	9.1	9.1	9.1
	≥140	10.5	9.8	9.8	9.8	9.8	9.8

Fastening screws for sandwich panels

Self-drilling screws ESPS-12-B 6,3/5,5xL with hexagon head and washer S16

Annex 47

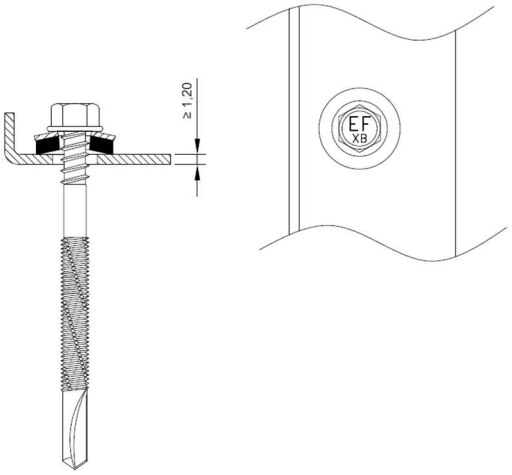
of European Technical Assessment ETA-16/0734

Materials

Fastener:	stainless steel – SAE304 (bi-metal)
Washer:	S16 – stainless steel washer with EPDM ring
Linear washer:	ELW-S made of stainless steel A2 – EN ISO 3506
Component I:	S280GD, S320GD or S350GD – EN 10346
Component II:	S235 to S355 – EN 10025-1 S280GD, S320GD or S350GD – EN 10346

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

Timber substructures
no performance assessed



$t_{N,II}$ [mm]		4.00	5.00	6.00	8.00	10.00	11.00
$V_{R,k}$ [kN] for $t_{N,I}$ [mm]	0.40	1.07	1.07	1.07	1.07	1.07	1.07
	0.50	1.39	1.39	1.39	1.39	1.39	1.39
	0.55	1.39	1.39	1.39	1.39	1.39	1.39
	0.60	1.39	1.39	1.39	1.39	1.39	1.39
	0.63	1.39	1.39	1.39	1.39	1.39	1.39
	0.70	1.83	1.83	1.83	1.83	1.83	1.83
	0.75	1.83	1.83	1.83	1.83	1.83	1.83
	0.88	1.83	1.83	1.83	1.83	1.83	1.83
	1.00	2.73	2.73	2.73	2.73	2.73	2.73
$N_{R,k}$ [kN] for $t_{N,I}$ [mm]	0.40	5.17	5.17	7.45	7.45	7.45	7.45
	0.50	5.17	5.17	7.45	7.45	7.45	7.45
	0.55	5.17	5.17	7.45	7.45	7.45	7.45
	0.60	5.17	5.17	7.45	7.45	7.45	7.45
	0.63	5.17	5.17	7.45	7.45	7.45	7.45
	0.70	5.17	5.17	7.45	7.45	7.45	7.45
	0.75	5.17	5.17	7.45	7.45	7.45	7.45
	0.88	5.17	5.17	7.45	7.45	7.45	7.45
	1.00	5.17	5.17	7.45	7.45	7.45	7.45
$N_{R\,II,k}$ [kN]		5.17	5.17	7.45	7.45	7.45	7.45
max. head displacement "u" depending on sandwich panel thickness [mm]	30	2.3	2.1	2.1	2.1	2.1	2.1
	40	3.0	2.8	2.8	2.8	2.8	2.8
	50	3.8	3.5	3.5	3.5	3.5	3.5
	60	4.5	4.2	4.2	4.2	4.2	4.2
	70	5.3	4.9	4.9	4.9	4.9	4.9
	80	6.0	5.6	5.6	5.6	5.6	5.6
	90	6.8	6.3	6.3	6.3	6.3	6.3
	100	7.5	7.0	7.0	7.0	7.0	7.0
	110	8.3	7.7	7.7	7.7	7.7	7.7
	120	9.0	8.4	8.4	8.4	8.4	8.4
	130	9.8	9.1	9.1	9.1	9.1	9.1
	≥140	10.5	9.8	9.8	9.8	9.8	9.8

Fastening screws for sandwich panels

Self-drilling screws ESPS-12-B 6,3/5,5xL with hexagon head, washer S16 and linear washer ELW-S

Annex 48

of European Technical Assessment ETA-16/0734

Materials

Fastener: stainless steel – SAE304 (bi-metal)

Washer: S16 – stainless steel washer with EPDM ring

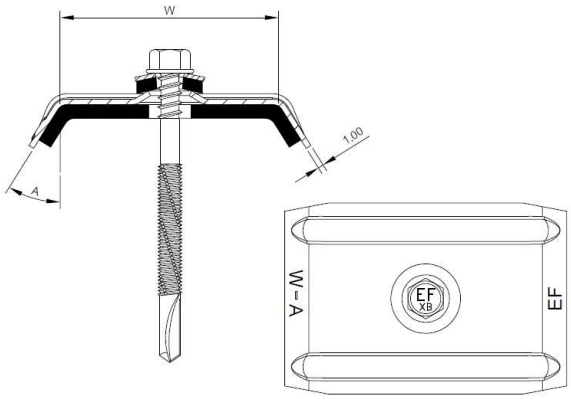
Saddle washer: ESW made of aluminum

Component I: S280GD, S320GD or S350GD – EN 10346

Component II: S235 to S355 – EN 10025-1
S280GD, S320GD or S350GD – EN 10346

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

Timber substructures
no performance assessed



$t_{N,II}$ [mm]		4.00	5.00	6.00	8.00	10.00	11.00
$V_{R,k}$ [kN] for $t_{N,I}$ [mm]	0.40	1.07	1.07	1.07	1.07	1.07	1.07
	0.50	1.39	1.39	1.39	1.39	1.39	1.39
	0.55	1.39	1.39	1.39	1.39	1.39	1.39
	0.60	1.39	1.39	1.39	1.39	1.39	1.39
	0.63	1.39	1.39	1.39	1.39	1.39	1.39
	0.70	1.83	1.83	1.83	1.83	1.83	1.83
	0.75	1.83	1.83	1.83	1.83	1.83	1.83
	0.88	1.83	1.83	1.83	1.83	1.83	1.83
	1.00	2.73	2.73	2.73	2.73	2.73	2.73
$N_{R,k}$ [kN] for $t_{N,I}$ [mm]	0.40	5.17	5.17	7.45	7.45	7.45	7.45
	0.50	5.17	5.17	7.45	7.45	7.45	7.45
	0.55	5.17	5.17	7.45	7.45	7.45	7.45
	0.60	5.17	5.17	7.45	7.45	7.45	7.45
	0.63	5.17	5.17	7.45	7.45	7.45	7.45
	0.70	5.17	5.17	7.45	7.45	7.45	7.45
	0.75	5.17	5.17	7.45	7.45	7.45	7.45
	0.88	5.17	5.17	7.45	7.45	7.45	7.45
	1.00	5.17	5.17	7.45	7.45	7.45	7.45
$N_{R\ II,k}$ [kN]		5.17	5.17	7.45	7.45	7.45	7.45
max. head displacement "u" depending on sandwich panel thickness [mm]	30	2.3	2.1	2.1	2.1	2.1	2.1
	40	3.0	2.8	2.8	2.8	2.8	2.8
	50	3.8	3.5	3.5	3.5	3.5	3.5
	60	4.5	4.2	4.2	4.2	4.2	4.2
	70	5.3	4.9	4.9	4.9	4.9	4.9
	80	6.0	5.6	5.6	5.6	5.6	5.6
	90	6.8	6.3	6.3	6.3	6.3	6.3
	100	7.5	7.0	7.0	7.0	7.0	7.0
	110	8.3	7.7	7.7	7.7	7.7	7.7
	120	9.0	8.4	8.4	8.4	8.4	8.4
	130	9.8	9.1	9.1	9.1	9.1	9.1
	≥140	10.5	9.8	9.8	9.8	9.8	9.8

Fastening screws for sandwich panels

Self-drilling screws ESPS-12-B 6,3/5,5xL with hexagon head, washer S16 and saddle washer ESW

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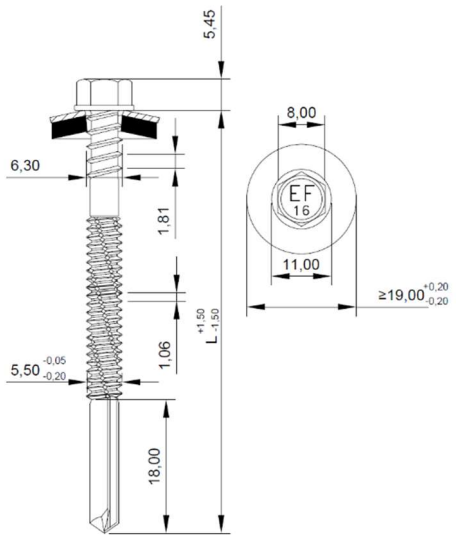
of European Technical Assessment ETA-16/0734

Materials

Fastener:	carbon steel – SAE1022, quenched, tempered and coated: galvanized (12 µm)
Washer:	Z19, Z22, Z25, Z29 – carbon steel washer with EPDM ring
Component I:	S280GD, S320GD or S350GD – EN 10346
Component II:	S235 to S355 – EN 10025-1 S280GD, S320GD or S350GD – EN 10346

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

Timber substructures
no performance assessed



$t_{N,II}$ [mm]		4.00	5.00	6.00	8.00	10.00	12.00	15.00
$V_{R,k}$ [kN] for $t_{N,I}$ [mm]	0.40	0.84	0.84	0.84	0.84	0.84	0.84	0.84
	0.50	1.72	1.72	1.72	1.72	1.72	1.72	1.72
	0.55	1.72	1.72	1.72	1.72	1.72	1.72	1.72
	0.60	1.72	1.72	1.72	1.72	1.72	1.72	1.72
	0.63	1.90	1.90	1.90	1.90	1.90	1.90	1.90
	0.70	1.99	1.99	1.99	1.99	1.99	1.99	1.99
	0.75	2.69	2.69	2.69	2.69	2.69	2.69	2.69
	0.88	2.69	2.69	2.69	2.69	2.69	2.69	2.69
	1.00	3.10	3.10	3.10	3.10	3.10	3.10	3.10
$N_{R,k}$ [kN] for $t_{N,I}$ [mm]	0.40	1.81	1.81	1.81	1.81	1.81	1.81	1.81
	0.50	4.14	4.14	4.14	4.14	4.14	4.14	4.14
	0.55	4.14	4.14	4.14	4.14	4.14	4.14	4.14
	0.60	4.14	4.14	4.14	4.14	4.14	4.14	4.14
	0.63	5.10	5.10	5.10	5.10	5.10	5.10	5.10
	0.70	5.50	5.50	5.50	5.50	5.50	5.50	5.50
	0.75	7.70	7.70	7.70	7.70	7.70	7.70	7.70
	0.88	7.70	7.70	7.70	7.70	7.70	7.70	7.70
	1.00	7.78	7.78	7.78	7.78	7.78	7.78	7.78
$N_{R\,II,k}$ [kN]		8.02	8.02	12.65	12.65	12.65	12.65	12.65
max. head displacement "u" depending on sandwich panel thickness [mm]	30	0.7	0.7	0.7	0.7	0.7	0.7	0.7
	40	0.9	0.9	0.9	0.9	0.9	0.9	0.9
	50	1.2	1.2	1.2	1.2	1.2	1.2	1.2
	60	1.4	1.4	1.4	1.4	1.4	1.4	1.4
	70	1.6	1.6	1.6	1.6	1.6	1.6	1.6
	80	1.8	1.8	1.8	1.8	1.8	1.8	1.8
	90	2.1	2.1	2.1	2.1	2.1	2.1	2.1
	100	2.3	2.3	2.3	2.3	2.3	2.3	2.3
	110	2.5	2.5	2.5	2.5	2.5	2.5	2.5
	120	2.8	2.8	2.8	2.8	2.8	2.8	2.8
	130	3.0	3.0	3.0	3.0	3.0	3.0	3.0
	≥140	3.2	3.2	3.2	3.2	3.2	3.2	3.2

Fastening screws for sandwich panels

Self-drilling screws ESPS-16-Z 6,3/5,5xL with hexagon head and washer Z19, Z22, Z25 or Z29

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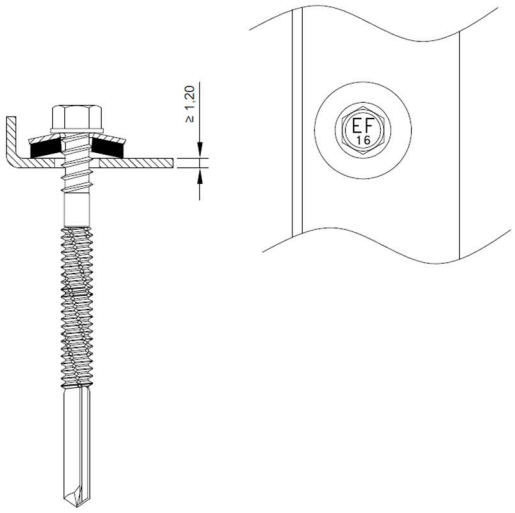
of European Technical Assessment ETA-16/0734

Materials

Fastener:	carbon steel – SAE1022, quenched, tempered and coated: galvanized (12 µm)
Washer:	Z19, Z22, Z25, Z29 – carbon steel washer with EPDM ring
Linear washer:	ELW-Z made of carbon steel – $R_{0,2} \geq 200$ MPa and galvanized min. 200 g/m² ELW-S made of stainless steel A2 – EN ISO 3506
Component I:	S280GD, S320GD or S350GD – EN 10346
Component II:	S235 to S355 – EN 10025-1 S280GD, S320GD or S350GD – EN 10346

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

Timber substructures
no performance assessed



$t_{N,II}$ [mm]		4.00	5.00	6.00	8.00	10.00	12.00	15.00
$V_{R,k}$ [kN] for $t_{N,I}$ [mm]	0.40	0.84	0.84	0.84	0.84	0.84	0.84	0.84
	0.50	1.72	1.72	1.72	1.72	1.72	1.72	1.72
	0.55	1.72	1.72	1.72	1.72	1.72	1.72	1.72
	0.60	1.72	1.72	1.72	1.72	1.72	1.72	1.72
	0.63	1.90	1.90	1.90	1.90	1.90	1.90	1.90
	0.70	1.99	1.99	1.99	1.99	1.99	1.99	1.99
	0.75	2.69	2.69	2.69	2.69	2.69	2.69	2.69
	0.88	2.69	2.69	2.69	2.69	2.69	2.69	2.69
	1.00	3.10	3.10	3.10	3.10	3.10	3.10	3.10
$N_{R,k}$ [kN] for $t_{N,I}$ [mm]	0.40	7.78	7.78	7.78	7.78	7.78	7.78	7.78
	0.50	7.78	7.78	7.78	7.78	7.78	7.78	7.78
	0.55	7.78	7.78	7.78	7.78	7.78	7.78	7.78
	0.60	7.78	7.78	7.78	7.78	7.78	7.78	7.78
	0.63	7.78	7.78	7.78	7.78	7.78	7.78	7.78
	0.70	7.78	7.78	7.78	7.78	7.78	7.78	7.78
	0.75	7.78	7.78	7.78	7.78	7.78	7.78	7.78
	0.88	7.78	7.78	7.78	7.78	7.78	7.78	7.78
	1.00	7.78	7.78	7.78	7.78	7.78	7.78	7.78
$N_{R\,II,k}$ [kN]		8.02	8.02	12.65	12.65	12.65	12.65	12.65
max. head displacement "u" depending on sandwich panel thickness [mm]	30	0.7	0.7	0.7	0.7	0.7	0.7	0.7
	40	0.9	0.9	0.9	0.9	0.9	0.9	0.9
	50	1.2	1.2	1.2	1.2	1.2	1.2	1.2
	60	1.4	1.4	1.4	1.4	1.4	1.4	1.4
	70	1.6	1.6	1.6	1.6	1.6	1.6	1.6
	80	1.8	1.8	1.8	1.8	1.8	1.8	1.8
	90	2.1	2.1	2.1	2.1	2.1	2.1	2.1
	100	2.3	2.3	2.3	2.3	2.3	2.3	2.3
	110	2.5	2.5	2.5	2.5	2.5	2.5	2.5
	120	2.8	2.8	2.8	2.8	2.8	2.8	2.8
	130	3.0	3.0	3.0	3.0	3.0	3.0	3.0
	≥140	3.2	3.2	3.2	3.2	3.2	3.2	3.2

Fastening screws for sandwich panels

Self-drilling screws ESPS-16-Z 6,3/5,5xL with hexagon head, washer Z19, Z22, Z25 or Z29 and linear washer ELW-Z or ELW-S

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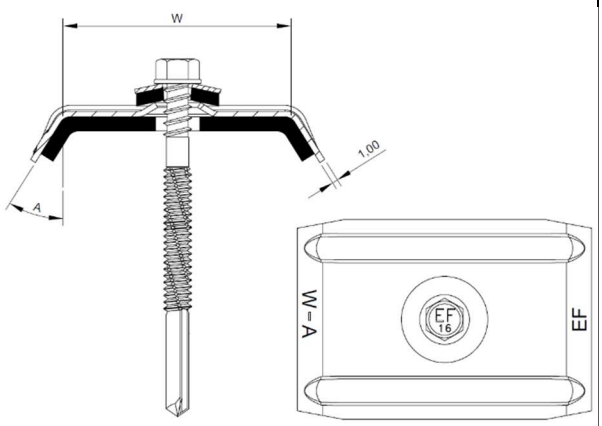
of European Technical Assessment ETA-16/0734

Materials

Fastener:	carbon steel – SAE1022, quenched, tempered and coated: galvanized (12 µm)
Washer:	Z19, Z22, Z25, Z29 – carbon steel washer with EPDM ring
Saddle washer:	ESW made of aluminum
Component I:	S280GD, S320GD or S350GD – EN 10346
Component II:	S235 to S355 – EN 10025-1 S280GD, S320GD or S350GD – EN 10346

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

Timber substructures
no performance assessed



$t_{N,II}$ [mm]		4.00	5.00	6.00	8.00	10.00	12.00	15.00
$V_{R,k}$ [kN] for $t_{N,I}$ [mm]	0.40	0.84	0.84	0.84	0.84	0.84	0.84	0.84
	0.50	1.72	1.72	1.72	1.72	1.72	1.72	1.72
	0.55	1.72	1.72	1.72	1.72	1.72	1.72	1.72
	0.60	1.72	1.72	1.72	1.72	1.72	1.72	1.72
	0.63	1.90	1.90	1.90	1.90	1.90	1.90	1.90
	0.70	1.99	1.99	1.99	1.99	1.99	1.99	1.99
	0.75	2.69	2.69	2.69	2.69	2.69	2.69	2.69
	0.88	2.69	2.69	2.69	2.69	2.69	2.69	2.69
	1.00	3.10	3.10	3.10	3.10	3.10	3.10	3.10
$N_{R,k}$ [kN] for $t_{N,I}$ [mm]	0.40	8.02	8.02	10.14	10.14	10.14	10.14	10.14
	0.50	8.02	8.02	10.90	10.90	10.90	10.90	10.90
	0.55	8.02	8.02	10.90	10.90	10.90	10.90	10.90
	0.60	8.02	8.02	10.90	10.90	10.90	10.90	10.90
	0.63	8.02	8.02	10.90	10.90	10.90	10.90	10.90
	0.70	8.02	8.02	10.90	10.90	10.90	10.90	10.90
	0.75	8.02	8.02	10.90	10.90	10.90	10.90	10.90
	0.88	8.02	8.02	10.90	10.90	10.90	10.90	10.90
	1.00	8.02	8.02	10.90	10.90	10.90	10.90	10.90
$N_{R\,II,k}$ [kN]		8.02	8.02	12.65	12.65	12.65	12.65	12.65
max. head displacement "u" depending on sandwich panel thickness [mm]	30	0.7	0.7	0.7	0.7	0.7	0.7	0.7
	40	0.9	0.9	0.9	0.9	0.9	0.9	0.9
	50	1.2	1.2	1.2	1.2	1.2	1.2	1.2
	60	1.4	1.4	1.4	1.4	1.4	1.4	1.4
	70	1.6	1.6	1.6	1.6	1.6	1.6	1.6
	80	1.8	1.8	1.8	1.8	1.8	1.8	1.8
	90	2.1	2.1	2.1	2.1	2.1	2.1	2.1
	100	2.3	2.3	2.3	2.3	2.3	2.3	2.3
	110	2.5	2.5	2.5	2.5	2.5	2.5	2.5
	120	2.8	2.8	2.8	2.8	2.8	2.8	2.8
	130	3.0	3.0	3.0	3.0	3.0	3.0	3.0
	≥140	3.2	3.2	3.2	3.2	3.2	3.2	3.2

Fastening screws for sandwich panels

Self-drilling screws ESPS-16-Z 6,3/5,5xL with hexagon head, washer Z19, Z22, Z25 or Z29 and saddle washer ESW

Annex 52

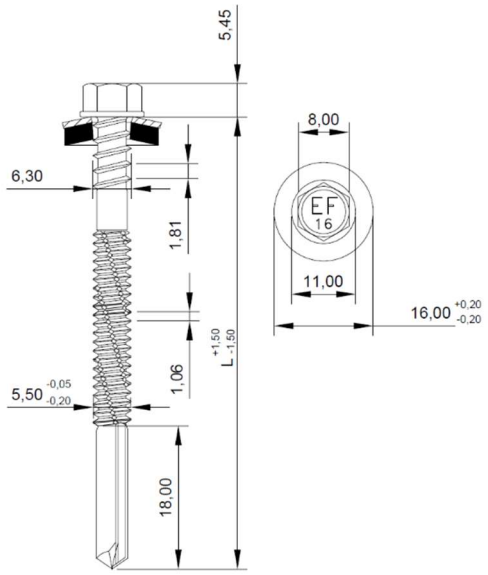
of European Technical Assessment ETA-16/0734

Materials

Fastener:	carbon steel – SAE1022, quenched, tempered and coated: galvanized (12 µm)
Washer:	Z16 – carbon steel washer with EPDM ring
Component I:	S280GD, S320GD or S350GD – EN 10346
Component II:	S235 to S355 – EN 10025-1 S280GD, S320GD or S350GD – EN 10346

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

Timber substructures
no performance assessed



$t_{N,II}$ [mm]		4.00	5.00	6.00	8.00	10.00	12.00	15.00
$V_{R,k}$ [kN] for $t_{N,I}$ [mm]	0.40	0.84	0.84	0.84	0.84	0.84	0.84	0.84
	0.50	1.72	1.72	1.72	1.72	1.72	1.72	1.72
	0.55	1.72	1.72	1.72	1.72	1.72	1.72	1.72
	0.60	1.72	1.72	1.72	1.72	1.72	1.72	1.72
	0.63	1.90	1.90	1.90	1.90	1.90	1.90	1.90
	0.70	1.99	1.99	1.99	1.99	1.99	1.99	1.99
	0.75	2.69	2.69	2.69	2.69	2.69	2.69	2.69
	0.88	2.69	2.69	2.69	2.69	2.69	2.69	2.69
	1.00	3.10	3.10	3.10	3.10	3.10	3.10	3.10
$N_{R,k}$ [kN] for $t_{N,I}$ [mm]	0.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40
	0.50	2.53	2.53	2.53	2.53	2.53	2.53	2.53
	0.55	2.53	2.53	2.53	2.53	2.53	2.53	2.53
	0.60	2.77	2.77	2.77	2.77	2.77	2.77	2.77
	0.63	2.77	2.77	2.77	2.77	2.77	2.77	2.77
	0.70	2.89	2.89	2.89	2.89	2.89	2.89	2.89
	0.75	2.89	2.89	2.89	2.89	2.89	2.89	2.89
	0.88	2.89	2.89	2.89	2.89	2.89	2.89	2.89
	1.00	4.27	4.27	4.27	4.27	4.27	4.27	4.27
$N_{R\,II,k}$ [kN]		8.02	8.02	12.65	12.65	12.65	12.65	12.65
max. head displacement "u" depending on sandwich panel thickness [mm]	30	0.7	0.7	0.7	0.7	0.7	0.7	0.7
	40	0.9	0.9	0.9	0.9	0.9	0.9	0.9
	50	1.2	1.2	1.2	1.2	1.2	1.2	1.2
	60	1.4	1.4	1.4	1.4	1.4	1.4	1.4
	70	1.6	1.6	1.6	1.6	1.6	1.6	1.6
	80	1.8	1.8	1.8	1.8	1.8	1.8	1.8
	90	2.1	2.1	2.1	2.1	2.1	2.1	2.1
	100	2.3	2.3	2.3	2.3	2.3	2.3	2.3
	110	2.5	2.5	2.5	2.5	2.5	2.5	2.5
	120	2.8	2.8	2.8	2.8	2.8	2.8	2.8
	130	3.0	3.0	3.0	3.0	3.0	3.0	3.0
	≥140	3.2	3.2	3.2	3.2	3.2	3.2	3.2

Fastening screws for sandwich panels

Self-drilling screws ESPS-16-Z 6,3/5,5xL with hexagon head and washer Z16

Annex 53

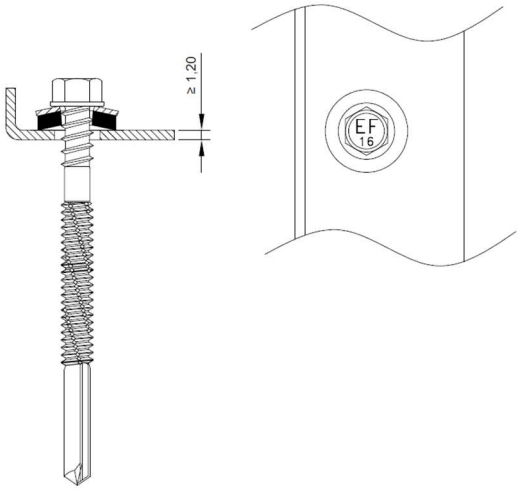
of European Technical Assessment ETA-16/0734

Materials

Fastener:	carbon steel – SAE1022, quenched, tempered and coated: galvanized (12 µm)
Washer:	Z16 – carbon steel washer with EPDM ring
Linear washer:	ELW-Z made of carbon steel – $R_{0,2} \geq 200$ MPa and galvanized min. 200 g/m² ELW-S made of stainless steel A2 – EN ISO 3506
Component I:	S280GD, S320GD or S350GD – EN 10346
Component II:	S235 to S355 – EN 10025-1 S280GD, S320GD or S350GD – EN 10346

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

Timber substructures
no performance assessed



$t_{N,II}$ [mm]		4.00	5.00	6.00	8.00	10.00	12.00	15.00
$V_{R,k}$ [kN] for $t_{N,I}$ [mm]	0.40	0.84	0.84	0.84	0.84	0.84	0.84	0.84
	0.50	1.72	1.72	1.72	1.72	1.72	1.72	1.72
	0.55	1.72	1.72	1.72	1.72	1.72	1.72	1.72
	0.60	1.72	1.72	1.72	1.72	1.72	1.72	1.72
	0.63	1.90	1.90	1.90	1.90	1.90	1.90	1.90
	0.70	1.99	1.99	1.99	1.99	1.99	1.99	1.99
	0.75	2.69	2.69	2.69	2.69	2.69	2.69	2.69
	0.88	2.69	2.69	2.69	2.69	2.69	2.69	2.69
	1.00	3.10	3.10	3.10	3.10	3.10	3.10	3.10
$N_{R,k}$ [kN] for $t_{N,I}$ [mm]	0.40	8.02	8.02	12.02	12.02	12.02	12.02	12.02
	0.50	8.02	8.02	12.02	12.02	12.02	12.02	12.02
	0.55	8.02	8.02	12.02	12.02	12.02	12.02	12.02
	0.60	8.02	8.02	12.02	12.02	12.02	12.02	12.02
	0.63	8.02	8.02	12.02	12.02	12.02	12.02	12.02
	0.70	8.02	8.02	12.02	12.02	12.02	12.02	12.02
	0.75	8.02	8.02	12.02	12.02	12.02	12.02	12.02
	0.88	8.02	8.02	12.02	12.02	12.02	12.02	12.02
	1.00	8.02	8.02	12.02	12.02	12.02	12.02	12.02
$N_{R\,II,k}$ [kN]		8.02	8.02	12.65	12.65	12.65	12.65	12.65
max. head displacement "u" depending on sandwich panel thickness [mm]	30	0.7	0.7	0.7	0.7	0.7	0.7	0.7
	40	0.9	0.9	0.9	0.9	0.9	0.9	0.9
	50	1.2	1.2	1.2	1.2	1.2	1.2	1.2
	60	1.4	1.4	1.4	1.4	1.4	1.4	1.4
	70	1.6	1.6	1.6	1.6	1.6	1.6	1.6
	80	1.8	1.8	1.8	1.8	1.8	1.8	1.8
	90	2.1	2.1	2.1	2.1	2.1	2.1	2.1
	100	2.3	2.3	2.3	2.3	2.3	2.3	2.3
	110	2.5	2.5	2.5	2.5	2.5	2.5	2.5
	120	2.8	2.8	2.8	2.8	2.8	2.8	2.8
	130	3.0	3.0	3.0	3.0	3.0	3.0	3.0
	≥140	3.2	3.2	3.2	3.2	3.2	3.2	3.2

Fastening screws for sandwich panels

Self-drilling screws ESPS-16-Z 6,3/5,5xL with hexagon head, washer Z16 and linear washer ELW-Z or ELW-S

Annex 54

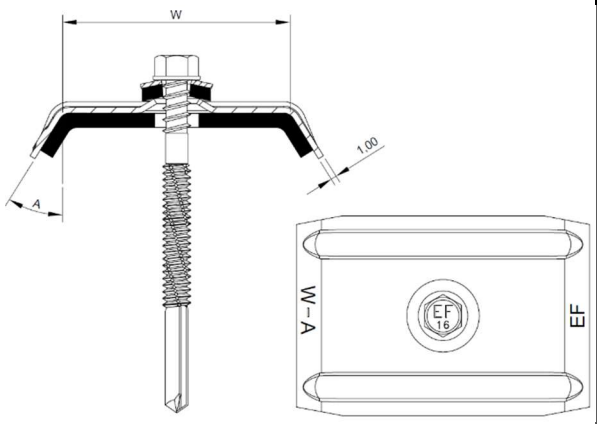
of European Technical Assessment ETA-16/0734

Materials

Fastener:	carbon steel – SAE1022, quenched, tempered and coated: galvanized (12 µm)
Washer:	Z16 – carbon steel washer with EPDM ring
Saddle washer:	ESW made of aluminum
Component I:	S280GD, S320GD or S350GD – EN 10346
Component II:	S235 to S355 – EN 10025-1 S280GD, S320GD or S350GD – EN 10346

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

Timber substructures
no performance assessed



$t_{N,II}$ [mm]		4.00	5.00	6.00	8.00	10.00	12.00	15.00
$V_{R,k}$ [kN] for $t_{N,I}$ [mm]	0.40	0.84	0.84	0.84	0.84	0.84	0.84	0.84
	0.50	1.72	1.72	1.72	1.72	1.72	1.72	1.72
	0.55	1.72	1.72	1.72	1.72	1.72	1.72	1.72
	0.60	1.72	1.72	1.72	1.72	1.72	1.72	1.72
	0.63	1.90	1.90	1.90	1.90	1.90	1.90	1.90
	0.70	1.99	1.99	1.99	1.99	1.99	1.99	1.99
	0.75	2.69	2.69	2.69	2.69	2.69	2.69	2.69
	0.88	2.69	2.69	2.69	2.69	2.69	2.69	2.69
	1.00	3.10	3.10	3.10	3.10	3.10	3.10	3.10
$N_{R,k}$ [kN] for $t_{N,I}$ [mm]	0.40	8.02	8.02	10.53	10.53	10.53	10.53	10.53
	0.50	8.02	8.02	10.92	10.92	10.92	10.92	10.92
	0.55	8.02	8.02	10.92	10.92	10.92	10.92	10.92
	0.60	8.02	8.02	10.92	10.92	10.92	10.92	10.92
	0.63	8.02	8.02	10.92	10.92	10.92	10.92	10.92
	0.70	8.02	8.02	10.92	10.92	10.92	10.92	10.92
	0.75	8.02	8.02	10.92	10.92	10.92	10.92	10.92
	0.88	8.02	8.02	10.92	10.92	10.92	10.92	10.92
	1.00	8.02	8.02	10.92	10.92	10.92	10.92	10.92
$N_{R\,II,k}$ [kN]		8.02	8.02	12.65	12.65	12.65	12.65	12.65
max. head displacement "u" depending on sandwich panel thickness [mm]	30	0.7	0.7	0.7	0.7	0.7	0.7	0.7
	40	0.9	0.9	0.9	0.9	0.9	0.9	0.9
	50	1.2	1.2	1.2	1.2	1.2	1.2	1.2
	60	1.4	1.4	1.4	1.4	1.4	1.4	1.4
	70	1.6	1.6	1.6	1.6	1.6	1.6	1.6
	80	1.8	1.8	1.8	1.8	1.8	1.8	1.8
	90	2.1	2.1	2.1	2.1	2.1	2.1	2.1
	100	2.3	2.3	2.3	2.3	2.3	2.3	2.3
	110	2.5	2.5	2.5	2.5	2.5	2.5	2.5
	120	2.8	2.8	2.8	2.8	2.8	2.8	2.8
	130	3.0	3.0	3.0	3.0	3.0	3.0	3.0
	≥140	3.2	3.2	3.2	3.2	3.2	3.2	3.2

Fastening screws for sandwich panels

Self-drilling screws ESPS-16-Z 6,3/5,5xL with hexagon head, washer Z16 and saddle washer ESW

Annex 55

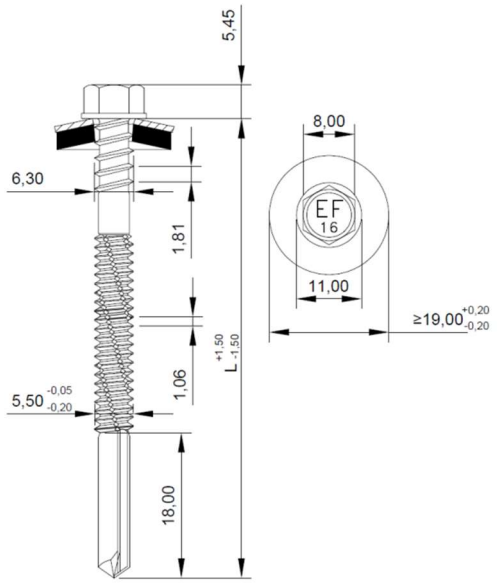
of European Technical Assessment ETA-16/0734

Materials

Fastener:	carbon steel – SAE1022, quenched, tempered and coated: galvanized with PREMIUM coating
Washer:	A19, A22, A25, A29 – aluminum washer with EPDM ring
Component I:	S280GD, S320GD or S350GD – EN 10346
Component II:	S235 to S355 – EN 10025-1 S280GD, S320GD or S350GD – EN 10346

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

Timber substructures
no performance assessed



$t_{N,II}$ [mm]		4.00	5.00	6.00	8.00	10.00	12.00	15.00
$V_{R,k}$ [kN] for $t_{N,I}$ [mm]	0.40	0.84	0.84	0.84	0.84	0.84	0.84	0.84
	0.50	1.72	1.72	1.72	1.72	1.72	1.72	1.72
	0.55	1.72	1.72	1.72	1.72	1.72	1.72	1.72
	0.60	1.72	1.72	1.72	1.72	1.72	1.72	1.72
	0.63	1.90	1.90	1.90	1.90	1.90	1.90	1.90
	0.70	1.99	1.99	1.99	1.99	1.99	1.99	1.99
	0.75	2.69	2.69	2.69	2.69	2.69	2.69	2.69
	0.88	2.69	2.69	2.69	2.69	2.69	2.69	2.69
	1.00	3.10	3.10	3.10	3.10	3.10	3.10	3.10
$N_{R,k}$ [kN] for $t_{N,I}$ [mm]	0.40	1.81	1.81	1.81	1.81	1.81	1.81	1.81
	0.50	4.14	4.14	4.14	4.14	4.14	4.14	4.14
	0.55	4.14	4.14	4.14	4.14	4.14	4.14	4.14
	0.60	4.14	4.14	4.14	4.14	4.14	4.14	4.14
	0.63	5.10	5.10	5.10	5.10	5.10	5.10	5.10
	0.70	5.50	5.50	5.50	5.50	5.50	5.50	5.50
	0.75	7.70	7.70	7.70	7.70	7.70	7.70	7.70
	0.88	7.70	7.70	7.70	7.70	7.70	7.70	7.70
	1.00	7.78	7.78	7.78	7.78	7.78	7.78	7.78
$N_{R\,II,k}$ [kN]		8.02	8.02	12.65	12.65	12.65	12.65	12.65
max. head displacement "u" depending on sandwich panel thickness [mm]	30	0.7	0.7	0.7	0.7	0.7	0.7	0.7
	40	0.9	0.9	0.9	0.9	0.9	0.9	0.9
	50	1.2	1.2	1.2	1.2	1.2	1.2	1.2
	60	1.4	1.4	1.4	1.4	1.4	1.4	1.4
	70	1.6	1.6	1.6	1.6	1.6	1.6	1.6
	80	1.8	1.8	1.8	1.8	1.8	1.8	1.8
	90	2.1	2.1	2.1	2.1	2.1	2.1	2.1
	100	2.3	2.3	2.3	2.3	2.3	2.3	2.3
	110	2.5	2.5	2.5	2.5	2.5	2.5	2.5
	120	2.8	2.8	2.8	2.8	2.8	2.8	2.8
	130	3.0	3.0	3.0	3.0	3.0	3.0	3.0
	≥140	3.2	3.2	3.2	3.2	3.2	3.2	3.2

Fastening screws for sandwich panels

Self-drilling screws ESPS-16-P 6,3/5,5xL with hexagon head and washer A19, A22, A25 or A29

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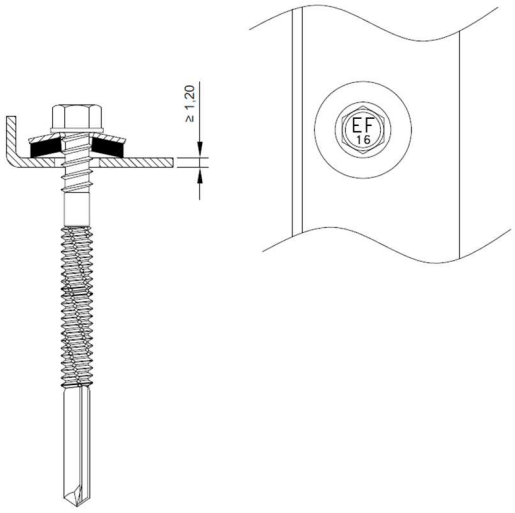
of European Technical Assessment ETA-16/0734

Materials

Fastener:	carbon steel – SAE1022, quenched, tempered and coated: galvanized with PREMIUM coating
Washer:	A19, A22, A25, A29 – aluminum washer with EPDM ring
Linear washer:	ELW-Z made of carbon steel – $R_{0,2} \geq 200$ MPa and galvanized min. 200 g/m^2 ELW-S made of stainless steel A2 – EN ISO 3506
Component I:	S280GD, S320GD or S350GD – EN 10346
Component II:	S235 to S355 – EN 10025-1 S280GD, S320GD or S350GD – EN 10346

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

Timber substructures
no performance assessed



$t_{N,II}$ [mm]		4.00	5.00	6.00	8.00	10.00	12.00	15.00
$V_{R,k}$ [kN] for $t_{N,I}$ [mm]	0.40	0.84	0.84	0.84	0.84	0.84	0.84	0.84
	0.50	1.72	1.72	1.72	1.72	1.72	1.72	1.72
	0.55	1.72	1.72	1.72	1.72	1.72	1.72	1.72
	0.60	1.72	1.72	1.72	1.72	1.72	1.72	1.72
	0.63	1.90	1.90	1.90	1.90	1.90	1.90	1.90
	0.70	1.99	1.99	1.99	1.99	1.99	1.99	1.99
	0.75	2.69	2.69	2.69	2.69	2.69	2.69	2.69
	0.88	2.69	2.69	2.69	2.69	2.69	2.69	2.69
	1.00	3.10	3.10	3.10	3.10	3.10	3.10	3.10
$N_{R,k}$ [kN] for $t_{N,I}$ [mm]	0.40	7.78	7.78	7.78	7.78	7.78	7.78	7.78
	0.50	7.78	7.78	7.78	7.78	7.78	7.78	7.78
	0.55	7.78	7.78	7.78	7.78	7.78	7.78	7.78
	0.60	7.78	7.78	7.78	7.78	7.78	7.78	7.78
	0.63	7.78	7.78	7.78	7.78	7.78	7.78	7.78
	0.70	7.78	7.78	7.78	7.78	7.78	7.78	7.78
	0.75	7.78	7.78	7.78	7.78	7.78	7.78	7.78
	0.88	7.78	7.78	7.78	7.78	7.78	7.78	7.78
	1.00	7.78	7.78	7.78	7.78	7.78	7.78	7.78
$N_{R\,II,k}$ [kN]		8.02	8.02	12.65	12.65	12.65	12.65	12.65
max. head displacement "u" depending on sandwich panel thickness [mm]	30	0.7	0.7	0.7	0.7	0.7	0.7	0.7
	40	0.9	0.9	0.9	0.9	0.9	0.9	0.9
	50	1.2	1.2	1.2	1.2	1.2	1.2	1.2
	60	1.4	1.4	1.4	1.4	1.4	1.4	1.4
	70	1.6	1.6	1.6	1.6	1.6	1.6	1.6
	80	1.8	1.8	1.8	1.8	1.8	1.8	1.8
	90	2.1	2.1	2.1	2.1	2.1	2.1	2.1
	100	2.3	2.3	2.3	2.3	2.3	2.3	2.3
	110	2.5	2.5	2.5	2.5	2.5	2.5	2.5
	120	2.8	2.8	2.8	2.8	2.8	2.8	2.8
	130	3.0	3.0	3.0	3.0	3.0	3.0	3.0
	≥140	3.2	3.2	3.2	3.2	3.2	3.2	3.2

Fastening screws for sandwich panels

Self-drilling screws ESPS-16-P 6,3/5,5xL with hexagon head, washer A19, A22, A25 or A29 and linear washer ELW-Z or ELW-S

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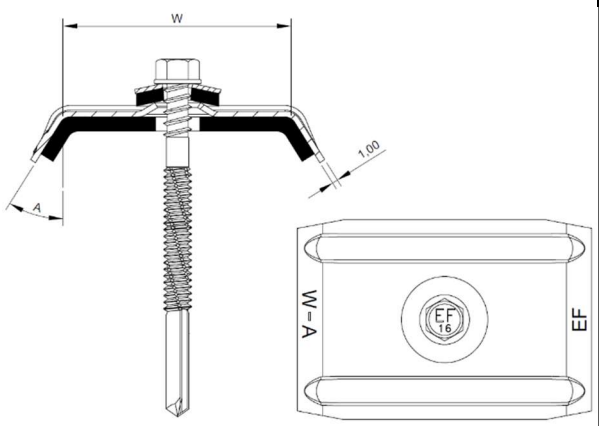
of European Technical Assessment ETA-16/0734

Materials

Fastener:	carbon steel – SAE1022, quenched, tempered and coated: galvanized with PREMIUM coating
Washer:	A19, A22, A25, A29 – aluminum washer with EPDM ring
Saddle washer:	ESW made of aluminum
Component I:	S280GD, S320GD or S350GD – EN 10346
Component II:	S235 to S355 – EN 10025-1 S280GD, S320GD or S350GD – EN 10346

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

Timber substructures
no performance assessed



$t_{N,II}$ [mm]		4.00	5.00	6.00	8.00	10.00	12.00	15.00
$V_{R,k}$ [kN] for $t_{N,I}$ [mm]	0.40	0.84	0.84	0.84	0.84	0.84	0.84	0.84
	0.50	1.72	1.72	1.72	1.72	1.72	1.72	1.72
	0.55	1.72	1.72	1.72	1.72	1.72	1.72	1.72
	0.60	1.72	1.72	1.72	1.72	1.72	1.72	1.72
	0.63	1.90	1.90	1.90	1.90	1.90	1.90	1.90
	0.70	1.99	1.99	1.99	1.99	1.99	1.99	1.99
	0.75	2.69	2.69	2.69	2.69	2.69	2.69	2.69
	0.88	2.69	2.69	2.69	2.69	2.69	2.69	2.69
	1.00	3.10	3.10	3.10	3.10	3.10	3.10	3.10
$N_{R,k}$ [kN] for $t_{N,I}$ [mm]	0.40	8.02	8.02	10.14	10.14	10.14	10.14	10.14
	0.50	8.02	8.02	10.90	10.90	10.90	10.90	10.90
	0.55	8.02	8.02	10.90	10.90	10.90	10.90	10.90
	0.60	8.02	8.02	10.90	10.90	10.90	10.90	10.90
	0.63	8.02	8.02	10.90	10.90	10.90	10.90	10.90
	0.70	8.02	8.02	10.90	10.90	10.90	10.90	10.90
	0.75	8.02	8.02	10.90	10.90	10.90	10.90	10.90
	0.88	8.02	8.02	10.90	10.90	10.90	10.90	10.90
	1.00	8.02	8.02	10.90	10.90	10.90	10.90	10.90
$N_{R\ II,k}$ [kN]		8.02	8.02	12.65	12.65	12.65	12.65	12.65
max. head displacement "u" depending on sandwich panel thickness [mm]	30	0.7	0.7	0.7	0.7	0.7	0.7	0.7
	40	0.9	0.9	0.9	0.9	0.9	0.9	0.9
	50	1.2	1.2	1.2	1.2	1.2	1.2	1.2
	60	1.4	1.4	1.4	1.4	1.4	1.4	1.4
	70	1.6	1.6	1.6	1.6	1.6	1.6	1.6
	80	1.8	1.8	1.8	1.8	1.8	1.8	1.8
	90	2.1	2.1	2.1	2.1	2.1	2.1	2.1
	100	2.3	2.3	2.3	2.3	2.3	2.3	2.3
	110	2.5	2.5	2.5	2.5	2.5	2.5	2.5
	120	2.8	2.8	2.8	2.8	2.8	2.8	2.8
	130	3.0	3.0	3.0	3.0	3.0	3.0	3.0
	≥140	3.2	3.2	3.2	3.2	3.2	3.2	3.2

Fastening screws for sandwich panels

Self-drilling screws ESPS-16-P 6,3/5,5xL with hexagon head, washer A19, A22, A25 or A29 and saddle washer ESW

Annex 58

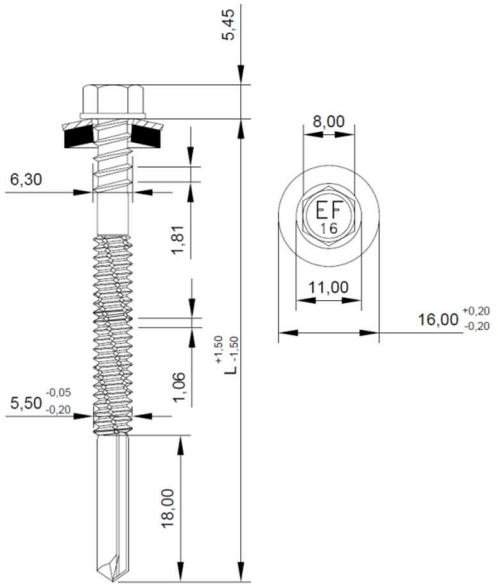
of European Technical Assessment ETA-16/0734

Materials

Fastener:	carbon steel – SAE1022, quenched, tempered and coated: galvanized with PREMIUM coating
Washer:	A16 – aluminum washer with EPDM ring
Component I:	S280GD, S320GD or S350GD – EN 10346
Component II:	S235 to S355 – EN 10025-1 S280GD, S320GD or S350GD – EN 10346

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

Timber substructures
no performance assessed



$t_{N,II}$ [mm]		4.00	5.00	6.00	8.00	10.00	12.00	15.00
$V_{R,k}$ [kN] for $t_{N,I}$ [mm]	0.40	0.84	0.84	0.84	0.84	0.84	0.84	0.84
	0.50	1.72	1.72	1.72	1.72	1.72	1.72	1.72
	0.55	1.72	1.72	1.72	1.72	1.72	1.72	1.72
	0.60	1.72	1.72	1.72	1.72	1.72	1.72	1.72
	0.63	1.90	1.90	1.90	1.90	1.90	1.90	1.90
	0.70	1.99	1.99	1.99	1.99	1.99	1.99	1.99
	0.75	2.69	2.69	2.69	2.69	2.69	2.69	2.69
	0.88	2.69	2.69	2.69	2.69	2.69	2.69	2.69
	1.00	3.10	3.10	3.10	3.10	3.10	3.10	3.10
$N_{R,k}$ [kN] for $t_{N,I}$ [mm]	0.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40
	0.50	2.53	2.53	2.53	2.53	2.53	2.53	2.53
	0.55	2.53	2.53	2.53	2.53	2.53	2.53	2.53
	0.60	2.77	2.77	2.77	2.77	2.77	2.77	2.77
	0.63	2.77	2.77	2.77	2.77	2.77	2.77	2.77
	0.70	2.89	2.89	2.89	2.89	2.89	2.89	2.89
	0.75	2.89	2.89	2.89	2.89	2.89	2.89	2.89
	0.88	2.89	2.89	2.89	2.89	2.89	2.89	2.89
	1.00	4.27	4.27	4.27	4.27	4.27	4.27	4.27
$N_{R\,II,k}$ [kN]		8.02	8.02	12.65	12.65	12.65	12.65	12.65
max. head displacement "u" depending on sandwich panel thickness [mm]	30	0.7	0.7	0.7	0.7	0.7	0.7	0.7
	40	0.9	0.9	0.9	0.9	0.9	0.9	0.9
	50	1.2	1.2	1.2	1.2	1.2	1.2	1.2
	60	1.4	1.4	1.4	1.4	1.4	1.4	1.4
	70	1.6	1.6	1.6	1.6	1.6	1.6	1.6
	80	1.8	1.8	1.8	1.8	1.8	1.8	1.8
	90	2.1	2.1	2.1	2.1	2.1	2.1	2.1
	100	2.3	2.3	2.3	2.3	2.3	2.3	2.3
	110	2.5	2.5	2.5	2.5	2.5	2.5	2.5
	120	2.8	2.8	2.8	2.8	2.8	2.8	2.8
	130	3.0	3.0	3.0	3.0	3.0	3.0	3.0
	≥140	3.2	3.2	3.2	3.2	3.2	3.2	3.2

Fastening screws for sandwich panels

Self-drilling screws ESPS-16-P 6,3/5,5xL with hexagon head and washer A16

Annex 59

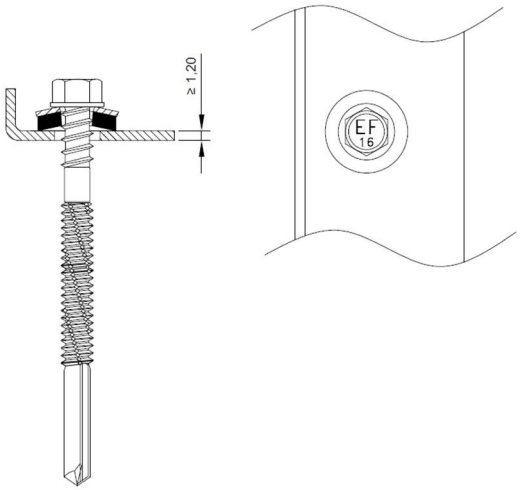
of European Technical Assessment ETA-16/0734

Materials

Fastener:	carbon steel – SAE1022, quenched, tempered and coated: galvanized with PREMIUM coating
Washer:	A16 – aluminum washer with EPDM ring
Linear washer:	ELW-Z made of carbon steel – $R_{0,2} \geq 200$ MPa and galvanized min. 200 g/m^2 ELW-S made of stainless steel A2 – EN ISO 3506
Component I:	S280GD, S320GD or S350GD – EN 10346
Component II:	S235 to S355 – EN 10025-1 S280GD, S320GD or S350GD – EN 10346

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

Timber substructures
no performance assessed



$t_{N,II}$ [mm]		4.00	5.00	6.00	8.00	10.00	12.00	15.00
$V_{R,k}$ [kN] for $t_{N,I}$ [mm]	0.40	0.84	0.84	0.84	0.84	0.84	0.84	0.84
	0.50	1.72	1.72	1.72	1.72	1.72	1.72	1.72
	0.55	1.72	1.72	1.72	1.72	1.72	1.72	1.72
	0.60	1.72	1.72	1.72	1.72	1.72	1.72	1.72
	0.63	1.90	1.90	1.90	1.90	1.90	1.90	1.90
	0.70	1.99	1.99	1.99	1.99	1.99	1.99	1.99
	0.75	2.69	2.69	2.69	2.69	2.69	2.69	2.69
	0.88	2.69	2.69	2.69	2.69	2.69	2.69	2.69
	1.00	3.10	3.10	3.10	3.10	3.10	3.10	3.10
$N_{R,k}$ [kN] for $t_{N,I}$ [mm]	0.40	8.02	8.02	12.02	12.02	12.02	12.02	12.02
	0.50	8.02	8.02	12.02	12.02	12.02	12.02	12.02
	0.55	8.02	8.02	12.02	12.02	12.02	12.02	12.02
	0.60	8.02	8.02	12.02	12.02	12.02	12.02	12.02
	0.63	8.02	8.02	12.02	12.02	12.02	12.02	12.02
	0.70	8.02	8.02	12.02	12.02	12.02	12.02	12.02
	0.75	8.02	8.02	12.02	12.02	12.02	12.02	12.02
	0.88	8.02	8.02	12.02	12.02	12.02	12.02	12.02
	1.00	8.02	8.02	12.02	12.02	12.02	12.02	12.02
$N_{R\,II,k}$ [kN]		8.02	8.02	12.65	12.65	12.65	12.65	12.65
max. head displacement "u" depending on sandwich panel thickness [mm]	30	0.7	0.7	0.7	0.7	0.7	0.7	0.7
	40	0.9	0.9	0.9	0.9	0.9	0.9	0.9
	50	1.2	1.2	1.2	1.2	1.2	1.2	1.2
	60	1.4	1.4	1.4	1.4	1.4	1.4	1.4
	70	1.6	1.6	1.6	1.6	1.6	1.6	1.6
	80	1.8	1.8	1.8	1.8	1.8	1.8	1.8
	90	2.1	2.1	2.1	2.1	2.1	2.1	2.1
	100	2.3	2.3	2.3	2.3	2.3	2.3	2.3
	110	2.5	2.5	2.5	2.5	2.5	2.5	2.5
	120	2.8	2.8	2.8	2.8	2.8	2.8	2.8
	130	3.0	3.0	3.0	3.0	3.0	3.0	3.0
	≥140	3.2	3.2	3.2	3.2	3.2	3.2	3.2

Fastening screws for sandwich panels

Self-drilling screws ESPS-16-P 6,3/5,5xL with hexagon head, washer A16 and linear washer ELW-Z or ELW-S

Annex 60

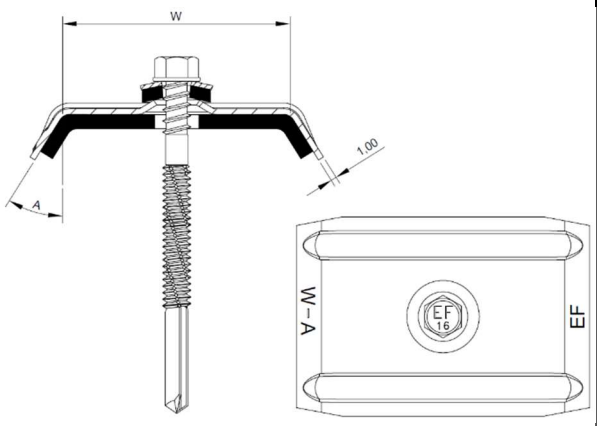
of European Technical Assessment ETA-16/0734

Materials

Fastener:	carbon steel – SAE1022, quenched, tempered and coated: galvanized with PREMIUM coating
Washer:	A16 – aluminum washer with EPDM ring
Saddle washer:	ESW made of aluminum
Component I:	S280GD, S320GD or S350GD – EN 10346
Component II:	S235 to S355 – EN 10025-1 S280GD, S320GD or S350GD – EN 10346

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

Timber substructures
no performance assessed



$t_{N,II}$ [mm]		4.00	5.00	6.00	8.00	10.00	12.00	15.00
$V_{R,k}$ [kN] for $t_{N,I}$ [mm]	0.40	0.84	0.84	0.84	0.84	0.84	0.84	0.84
	0.50	1.72	1.72	1.72	1.72	1.72	1.72	1.72
	0.55	1.72	1.72	1.72	1.72	1.72	1.72	1.72
	0.60	1.72	1.72	1.72	1.72	1.72	1.72	1.72
	0.63	1.90	1.90	1.90	1.90	1.90	1.90	1.90
	0.70	1.99	1.99	1.99	1.99	1.99	1.99	1.99
	0.75	2.69	2.69	2.69	2.69	2.69	2.69	2.69
	0.88	2.69	2.69	2.69	2.69	2.69	2.69	2.69
	1.00	3.10	3.10	3.10	3.10	3.10	3.10	3.10
$N_{R,k}$ [kN] for $t_{N,I}$ [mm]	0.40	8.02	8.02	10.53	10.53	10.53	10.53	10.53
	0.50	8.02	8.02	10.92	10.92	10.92	10.92	10.92
	0.55	8.02	8.02	10.92	10.92	10.92	10.92	10.92
	0.60	8.02	8.02	10.92	10.92	10.92	10.92	10.92
	0.63	8.02	8.02	10.92	10.92	10.92	10.92	10.92
	0.70	8.02	8.02	10.92	10.92	10.92	10.92	10.92
	0.75	8.02	8.02	10.92	10.92	10.92	10.92	10.92
	0.88	8.02	8.02	10.92	10.92	10.92	10.92	10.92
	1.00	8.02	8.02	10.92	10.92	10.92	10.92	10.92
$N_{R\,II,k}$ [kN]		8.02	8.02	12.65	12.65	12.65	12.65	12.65
max. head displacement "u" depending on sandwich panel thickness [mm]	30	0.7	0.7	0.7	0.7	0.7	0.7	0.7
	40	0.9	0.9	0.9	0.9	0.9	0.9	0.9
	50	1.2	1.2	1.2	1.2	1.2	1.2	1.2
	60	1.4	1.4	1.4	1.4	1.4	1.4	1.4
	70	1.6	1.6	1.6	1.6	1.6	1.6	1.6
	80	1.8	1.8	1.8	1.8	1.8	1.8	1.8
	90	2.1	2.1	2.1	2.1	2.1	2.1	2.1
	100	2.3	2.3	2.3	2.3	2.3	2.3	2.3
	110	2.5	2.5	2.5	2.5	2.5	2.5	2.5
	120	2.8	2.8	2.8	2.8	2.8	2.8	2.8
	130	3.0	3.0	3.0	3.0	3.0	3.0	3.0
	≥140	3.2	3.2	3.2	3.2	3.2	3.2	3.2

Fastening screws for sandwich panels

Self-drilling screws ESPS-16-P 6,3/5,5xL with hexagon head, washer A16 and saddle washer ESW

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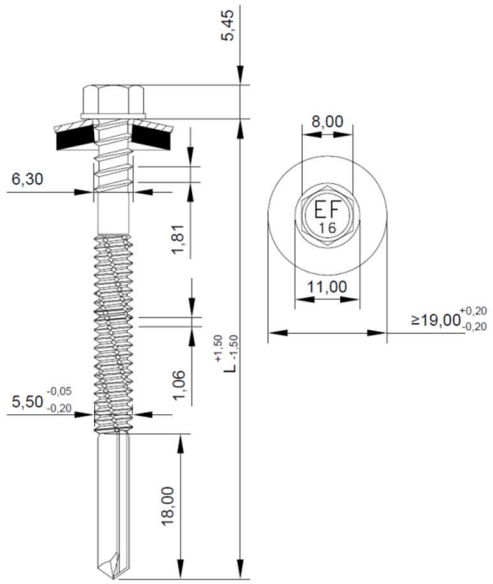
of European Technical Assessment ETA-16/0734

Materials

Fastener:	carbon steel – SAE1022, quenched, tempered and coated: galvanized with SUPER PREMIUM coating
Washer:	S19, S22, S25, S29 – stainless steel washer with EPDM ring or A19, A22, A25, A29 – aluminum washer with EPDM ring
Component I:	S280GD, S320GD or S350GD – EN 10346
Component II:	S235 to S355 – EN 10025-1 S280GD, S320GD or S350GD – EN 10346

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

Timber substructures
no performance assessed



$t_{N,II}$ [mm]		4.00	5.00	6.00	8.00	10.00	12.00	15.00
$V_{R,k}$ [kN] for $t_{N,I}$ [mm]	0.40	0.84	0.84	0.84	0.84	0.84	0.84	0.84
	0.50	1.72	1.72	1.72	1.72	1.72	1.72	1.72
	0.55	1.72	1.72	1.72	1.72	1.72	1.72	1.72
	0.60	1.72	1.72	1.72	1.72	1.72	1.72	1.72
	0.63	1.90	1.90	1.90	1.90	1.90	1.90	1.90
	0.70	1.99	1.99	1.99	1.99	1.99	1.99	1.99
	0.75	2.69	2.69	2.69	2.69	2.69	2.69	2.69
	0.88	2.69	2.69	2.69	2.69	2.69	2.69	2.69
	1.00	3.10	3.10	3.10	3.10	3.10	3.10	3.10
$N_{R,k}$ [kN] for $t_{N,I}$ [mm]	0.40	1.81	1.81	1.81	1.81	1.81	1.81	1.81
	0.50	4.14	4.14	4.14	4.14	4.14	4.14	4.14
	0.55	4.14	4.14	4.14	4.14	4.14	4.14	4.14
	0.60	4.14	4.14	4.14	4.14	4.14	4.14	4.14
	0.63	5.10	5.10	5.10	5.10	5.10	5.10	5.10
	0.70	5.50	5.50	5.50	5.50	5.50	5.50	5.50
	0.75	7.70	7.70	7.70	7.70	7.70	7.70	7.70
	0.88	7.70	7.70	7.70	7.70	7.70	7.70	7.70
	1.00	7.78	7.78	7.78	7.78	7.78	7.78	7.78
$N_{R\ II,k}$ [kN]		8.02	8.02	12.65	12.65	12.65	12.65	12.65
max. head displacement "u" depending on sandwich panel thickness [mm]	30	0.7	0.7	0.7	0.7	0.7	0.7	0.7
	40	0.9	0.9	0.9	0.9	0.9	0.9	0.9
	50	1.2	1.2	1.2	1.2	1.2	1.2	1.2
	60	1.4	1.4	1.4	1.4	1.4	1.4	1.4
	70	1.6	1.6	1.6	1.6	1.6	1.6	1.6
	80	1.8	1.8	1.8	1.8	1.8	1.8	1.8
	90	2.1	2.1	2.1	2.1	2.1	2.1	2.1
	100	2.3	2.3	2.3	2.3	2.3	2.3	2.3
	110	2.5	2.5	2.5	2.5	2.5	2.5	2.5
	120	2.8	2.8	2.8	2.8	2.8	2.8	2.8
	130	3.0	3.0	3.0	3.0	3.0	3.0	3.0
	≥140	3.2	3.2	3.2	3.2	3.2	3.2	3.2

Fastening screws for sandwich panels

Self-drilling screws ESPS-16-SP 6,3/5,5xL with hexagon head, washer S19, S22, S25, S29, A19, A22, A25 or A29

Annex 62

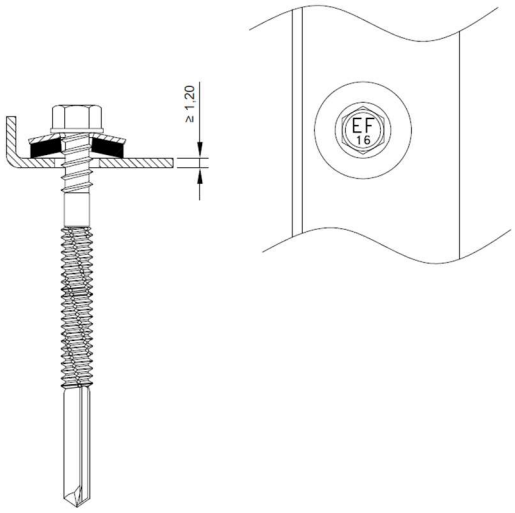
of European Technical Assessment ETA-16/0734

Materials

Fastener:	carbon steel – SAE1022, quenched, tempered and coated: galvanized with SUPER PREMIUM coating
Washer:	S19, S22, S25, S29 – stainless steel washer with EPDM ring or A19, A22, A25, A29 – aluminum washer with EPDM ring
Linear washer:	ELW-Z made of carbon steel – $R_{0,2} \geq 200$ MPa and galvanized min. 200 g/m^2 ELW-S made of stainless steel A2 – EN ISO 3506
Component I:	S280GD, S320GD or S350GD – EN 10346
Component II:	S235 to S355 – EN 10025-1 S280GD, S320GD or S350GD – EN 10346

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

Timber substructures
no performance assessed



$t_{N,II}$ [mm]		4.00	5.00	6.00	8.00	10.00	12.00	15.00
$V_{R,k}$ [kN] for $t_{N,I}$ [mm]	0.40	0.84	0.84	0.84	0.84	0.84	0.84	0.84
	0.50	1.72	1.72	1.72	1.72	1.72	1.72	1.72
	0.55	1.72	1.72	1.72	1.72	1.72	1.72	1.72
	0.60	1.72	1.72	1.72	1.72	1.72	1.72	1.72
	0.63	1.90	1.90	1.90	1.90	1.90	1.90	1.90
	0.70	1.99	1.99	1.99	1.99	1.99	1.99	1.99
	0.75	2.69	2.69	2.69	2.69	2.69	2.69	2.69
	0.88	2.69	2.69	2.69	2.69	2.69	2.69	2.69
	1.00	3.10	3.10	3.10	3.10	3.10	3.10	3.10
$N_{R,k}$ [kN] for $t_{N,I}$ [mm]	0.40	7.78	7.78	7.78	7.78	7.78	7.78	7.78
	0.50	7.78	7.78	7.78	7.78	7.78	7.78	7.78
	0.55	7.78	7.78	7.78	7.78	7.78	7.78	7.78
	0.60	7.78	7.78	7.78	7.78	7.78	7.78	7.78
	0.63	7.78	7.78	7.78	7.78	7.78	7.78	7.78
	0.70	7.78	7.78	7.78	7.78	7.78	7.78	7.78
	0.75	7.78	7.78	7.78	7.78	7.78	7.78	7.78
	0.88	7.78	7.78	7.78	7.78	7.78	7.78	7.78
	1.00	7.78	7.78	7.78	7.78	7.78	7.78	7.78
$N_{R\,II,k}$ [kN]		8.02	8.02	12.65	12.65	12.65	12.65	12.65
max. head displacement "u" depending on sandwich panel thickness [mm]	30	0.7	0.7	0.7	0.7	0.7	0.7	0.7
	40	0.9	0.9	0.9	0.9	0.9	0.9	0.9
	50	1.2	1.2	1.2	1.2	1.2	1.2	1.2
	60	1.4	1.4	1.4	1.4	1.4	1.4	1.4
	70	1.6	1.6	1.6	1.6	1.6	1.6	1.6
	80	1.8	1.8	1.8	1.8	1.8	1.8	1.8
	90	2.1	2.1	2.1	2.1	2.1	2.1	2.1
	100	2.3	2.3	2.3	2.3	2.3	2.3	2.3
	110	2.5	2.5	2.5	2.5	2.5	2.5	2.5
	120	2.8	2.8	2.8	2.8	2.8	2.8	2.8
	130	3.0	3.0	3.0	3.0	3.0	3.0	3.0
	≥140	3.2	3.2	3.2	3.2	3.2	3.2	3.2

Fastening screws for sandwich panels

Self-drilling screws ESPS-16-SP 6,3/5,5xL with hexagon head, washer S19, S22, S25, S29, A19, A22, A25 or A29 and linear washer ELW-Z or ELW-S

Annex 63

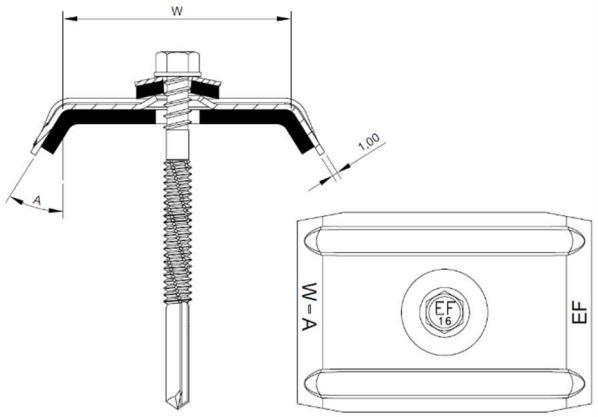
of European Technical Assessment ETA-16/0734

Materials

Fastener:	carbon steel – SAE1022, quenched, tempered and coated: galvanized with SUPER PREMIUM coating
Washer:	S19, S22, S25, S29 – stainless steel washer with EPDM ring or A19, A22, A25, A29 – aluminum washer with EPDM ring
Saddle washer:	ESW made of aluminum
Component I:	S280GD, S320GD or S350GD – EN 10346
Component II:	S235 to S355 – EN 10025-1 S280GD, S320GD or S350GD – EN 10346

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

Timber substructures
no performance assessed



$t_{N,II}$ [mm]		4.00	5.00	6.00	8.00	10.00	12.00	15.00
$V_{R,k}$ [kN] for $t_{N,I}$ [mm]	0.40	0.84	0.84	0.84	0.84	0.84	0.84	0.84
	0.50	1.72	1.72	1.72	1.72	1.72	1.72	1.72
	0.55	1.72	1.72	1.72	1.72	1.72	1.72	1.72
	0.60	1.72	1.72	1.72	1.72	1.72	1.72	1.72
	0.63	1.90	1.90	1.90	1.90	1.90	1.90	1.90
	0.70	1.99	1.99	1.99	1.99	1.99	1.99	1.99
	0.75	2.69	2.69	2.69	2.69	2.69	2.69	2.69
	0.88	2.69	2.69	2.69	2.69	2.69	2.69	2.69
	1.00	3.10	3.10	3.10	3.10	3.10	3.10	3.10
$N_{R,k}$ [kN] for $t_{N,I}$ [mm]	0.40	8.02	8.02	10.14	10.14	10.14	10.14	10.14
	0.50	8.02	8.02	10.90	10.90	10.90	10.90	10.90
	0.55	8.02	8.02	10.90	10.90	10.90	10.90	10.90
	0.60	8.02	8.02	10.90	10.90	10.90	10.90	10.90
	0.63	8.02	8.02	10.90	10.90	10.90	10.90	10.90
	0.70	8.02	8.02	10.90	10.90	10.90	10.90	10.90
	0.75	8.02	8.02	10.90	10.90	10.90	10.90	10.90
	0.88	8.02	8.02	10.90	10.90	10.90	10.90	10.90
	1.00	8.02	8.02	10.90	10.90	10.90	10.90	10.90
$N_{R\ II,k}$ [kN]		8.02	8.02	12.65	12.65	12.65	12.65	12.65
max. head displacement "u" depending on sandwich panel thickness [mm]	30	0.7	0.7	0.7	0.7	0.7	0.7	0.7
	40	0.9	0.9	0.9	0.9	0.9	0.9	0.9
	50	1.2	1.2	1.2	1.2	1.2	1.2	1.2
	60	1.4	1.4	1.4	1.4	1.4	1.4	1.4
	70	1.6	1.6	1.6	1.6	1.6	1.6	1.6
	80	1.8	1.8	1.8	1.8	1.8	1.8	1.8
	90	2.1	2.1	2.1	2.1	2.1	2.1	2.1
	100	2.3	2.3	2.3	2.3	2.3	2.3	2.3
	110	2.5	2.5	2.5	2.5	2.5	2.5	2.5
	120	2.8	2.8	2.8	2.8	2.8	2.8	2.8
	130	3.0	3.0	3.0	3.0	3.0	3.0	3.0
	≥140	3.2	3.2	3.2	3.2	3.2	3.2	3.2

Fastening screws for sandwich panels

Self-drilling screws ESPS-16-SP 6,3/5,5xL with hexagon head, washer S19, S22, S25, S29, A19, A22, A25 or A29 and saddle washer ESW

Annex 64

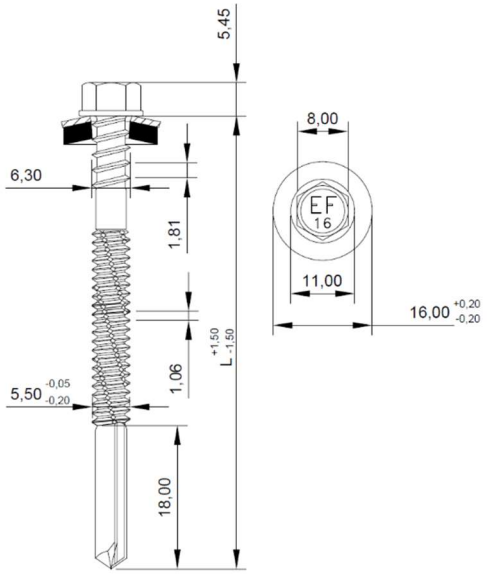
of European Technical Assessment ETA-16/0734

Materials

Fastener:	carbon steel – SAE1022, quenched, tempered and coated: galvanized with SUPER PREMIUM coating
Washer:	S16 – stainless steel washer with EPDM ring or A16 – aluminum washer with EPDM ring
Component I:	S280GD, S320GD or S350GD – EN 10346
Component II:	S235 to S355 – EN 10025-1 S280GD, S320GD or S350GD – EN 10346

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

Timber substructures
no performance assessed



$t_{N,II}$ [mm]		4.00	5.00	6.00	8.00	10.00	12.00	15.00
$V_{R,k}$ [kN] for $t_{N,I}$ [mm]	0.40	0.84	0.84	0.84	0.84	0.84	0.84	0.84
	0.50	1.72	1.72	1.72	1.72	1.72	1.72	1.72
	0.55	1.72	1.72	1.72	1.72	1.72	1.72	1.72
	0.60	1.72	1.72	1.72	1.72	1.72	1.72	1.72
	0.63	1.90	1.90	1.90	1.90	1.90	1.90	1.90
	0.70	1.99	1.99	1.99	1.99	1.99	1.99	1.99
	0.75	2.69	2.69	2.69	2.69	2.69	2.69	2.69
	0.88	2.69	2.69	2.69	2.69	2.69	2.69	2.69
	1.00	3.10	3.10	3.10	3.10	3.10	3.10	3.10
$N_{R,k}$ [kN] for $t_{N,I}$ [mm]	0.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40
	0.50	2.53	2.53	2.53	2.53	2.53	2.53	2.53
	0.55	2.53	2.53	2.53	2.53	2.53	2.53	2.53
	0.60	2.77	2.77	2.77	2.77	2.77	2.77	2.77
	0.63	2.77	2.77	2.77	2.77	2.77	2.77	2.77
	0.70	2.89	2.89	2.89	2.89	2.89	2.89	2.89
	0.75	2.89	2.89	2.89	2.89	2.89	2.89	2.89
	0.88	2.89	2.89	2.89	2.89	2.89	2.89	2.89
	1.00	4.27	4.27	4.27	4.27	4.27	4.27	4.27
$N_{R\,II,k}$ [kN]		8.02	8.02	12.65	12.65	12.65	12.65	12.65
max. head displacement "u" depending on sandwich panel thickness [mm]	30	0.7	0.7	0.7	0.7	0.7	0.7	0.7
	40	0.9	0.9	0.9	0.9	0.9	0.9	0.9
	50	1.2	1.2	1.2	1.2	1.2	1.2	1.2
	60	1.4	1.4	1.4	1.4	1.4	1.4	1.4
	70	1.6	1.6	1.6	1.6	1.6	1.6	1.6
	80	1.8	1.8	1.8	1.8	1.8	1.8	1.8
	90	2.1	2.1	2.1	2.1	2.1	2.1	2.1
	100	2.3	2.3	2.3	2.3	2.3	2.3	2.3
	110	2.5	2.5	2.5	2.5	2.5	2.5	2.5
	120	2.8	2.8	2.8	2.8	2.8	2.8	2.8
	130	3.0	3.0	3.0	3.0	3.0	3.0	3.0
	≥140	3.2	3.2	3.2	3.2	3.2	3.2	3.2

Fastening screws for sandwich panels

Self-drilling screws ESPS-16-SP 6,3/5,5xL with hexagon head and washer S16 or A16

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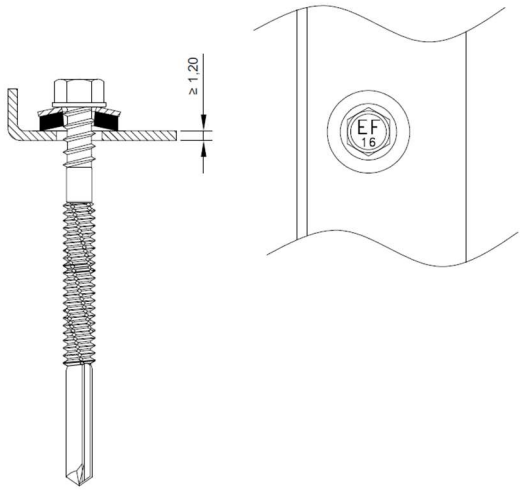
of European Technical Assessment ETA-16/0734

Materials

Fastener:	carbon steel – SAE1022, quenched, tempered and coated: galvanized with SUPER PREMIUM coating
Washer:	S16 – stainless steel washer with EPDM ring or A16 – aluminum washer with EPDM ring
Linear washer:	ELW-Z made of carbon steel – $R_{0,2} \geq 200$ MPa and galvanized min. 200 g/m^2 ELW-S made of stainless steel A2 – EN ISO 3506
Component I:	S280GD, S320GD or S350GD – EN 10346
Component II:	S235 to S355 – EN 10025-1 S280GD, S320GD or S350GD – EN 10346

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

Timber substructures
no performance assessed



$t_{N,II}$ [mm]		4.00	5.00	6.00	8.00	10.00	12.00	15.00
$V_{R,k}$ [kN] for $t_{N,I}$ [mm]	0.40	0.84	0.84	0.84	0.84	0.84	0.84	0.84
	0.50	1.72	1.72	1.72	1.72	1.72	1.72	1.72
	0.55	1.72	1.72	1.72	1.72	1.72	1.72	1.72
	0.60	1.72	1.72	1.72	1.72	1.72	1.72	1.72
	0.63	1.90	1.90	1.90	1.90	1.90	1.90	1.90
	0.70	1.99	1.99	1.99	1.99	1.99	1.99	1.99
	0.75	2.69	2.69	2.69	2.69	2.69	2.69	2.69
	0.88	2.69	2.69	2.69	2.69	2.69	2.69	2.69
	1.00	3.10	3.10	3.10	3.10	3.10	3.10	3.10
$N_{R,k}$ [kN] for $t_{N,I}$ [mm]	0.40	8.02	8.02	12.02	12.02	12.02	12.02	12.02
	0.50	8.02	8.02	12.02	12.02	12.02	12.02	12.02
	0.55	8.02	8.02	12.02	12.02	12.02	12.02	12.02
	0.60	8.02	8.02	12.02	12.02	12.02	12.02	12.02
	0.63	8.02	8.02	12.02	12.02	12.02	12.02	12.02
	0.70	8.02	8.02	12.02	12.02	12.02	12.02	12.02
	0.75	8.02	8.02	12.02	12.02	12.02	12.02	12.02
	0.88	8.02	8.02	12.02	12.02	12.02	12.02	12.02
	1.00	8.02	8.02	12.02	12.02	12.02	12.02	12.02
$N_{R\,II,k}$ [kN]		8.02	8.02	12.65	12.65	12.65	12.65	12.65
max. head displacement "u" depending on sandwich panel thickness [mm]	30	0.7	0.7	0.7	0.7	0.7	0.7	0.7
	40	0.9	0.9	0.9	0.9	0.9	0.9	0.9
	50	1.2	1.2	1.2	1.2	1.2	1.2	1.2
	60	1.4	1.4	1.4	1.4	1.4	1.4	1.4
	70	1.6	1.6	1.6	1.6	1.6	1.6	1.6
	80	1.8	1.8	1.8	1.8	1.8	1.8	1.8
	90	2.1	2.1	2.1	2.1	2.1	2.1	2.1
	100	2.3	2.3	2.3	2.3	2.3	2.3	2.3
	110	2.5	2.5	2.5	2.5	2.5	2.5	2.5
	120	2.8	2.8	2.8	2.8	2.8	2.8	2.8
	130	3.0	3.0	3.0	3.0	3.0	3.0	3.0
	≥140	3.2	3.2	3.2	3.2	3.2	3.2	3.2

Fastening screws for sandwich panels

Self-drilling screws ESPS-16-SP 6,3/5,5xL with hexagon head, washer S16 or A16 and linear washer ELW-Z or ELW-S

Annex 66

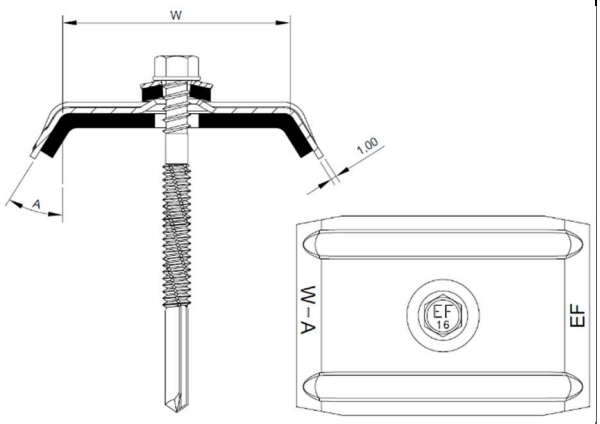
of European Technical Assessment ETA-16/0734

Materials

Fastener:	carbon steel – SAE1022, quenched, tempered and coated: galvanized with SUPER PREMIUM coating
Washer:	S16 – stainless steel washer with EPDM ring or A16 – aluminum washer with EPDM ring
Saddle washer:	ESW made of aluminum
Component I:	S280GD, S320GD or S350GD – EN 10346
Component II:	S235 to S355 – EN 10025-1 S280GD, S320GD or S350GD – EN 10346

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

Timber substructures
no performance assessed



$t_{N,II}$ [mm]		4.00	5.00	6.00	8.00	10.00	12.00	15.00
$V_{R,k}$ [kN] for $t_{N,I}$ [mm]	0.40	0.84	0.84	0.84	0.84	0.84	0.84	0.84
	0.50	1.72	1.72	1.72	1.72	1.72	1.72	1.72
	0.55	1.72	1.72	1.72	1.72	1.72	1.72	1.72
	0.60	1.72	1.72	1.72	1.72	1.72	1.72	1.72
	0.63	1.90	1.90	1.90	1.90	1.90	1.90	1.90
	0.70	1.99	1.99	1.99	1.99	1.99	1.99	1.99
	0.75	2.69	2.69	2.69	2.69	2.69	2.69	2.69
	0.88	2.69	2.69	2.69	2.69	2.69	2.69	2.69
	1.00	3.10	3.10	3.10	3.10	3.10	3.10	3.10
$N_{R,k}$ [kN] for $t_{N,I}$ [mm]	0.40	8.02	8.02	10.53	10.53	10.53	10.53	10.53
	0.50	8.02	8.02	10.92	10.92	10.92	10.92	10.92
	0.55	8.02	8.02	10.92	10.92	10.92	10.92	10.92
	0.60	8.02	8.02	10.92	10.92	10.92	10.92	10.92
	0.63	8.02	8.02	10.92	10.92	10.92	10.92	10.92
	0.70	8.02	8.02	10.92	10.92	10.92	10.92	10.92
	0.75	8.02	8.02	10.92	10.92	10.92	10.92	10.92
	0.88	8.02	8.02	10.92	10.92	10.92	10.92	10.92
	1.00	8.02	8.02	10.92	10.92	10.92	10.92	10.92
$N_{R\ II,k}$ [kN]		8.02	8.02	12.65	12.65	12.65	12.65	12.65
max. head displacement "u" depending on sandwich panel thickness [mm]	30	0.7	0.7	0.7	0.7	0.7	0.7	0.7
	40	0.9	0.9	0.9	0.9	0.9	0.9	0.9
	50	1.2	1.2	1.2	1.2	1.2	1.2	1.2
	60	1.4	1.4	1.4	1.4	1.4	1.4	1.4
	70	1.6	1.6	1.6	1.6	1.6	1.6	1.6
	80	1.8	1.8	1.8	1.8	1.8	1.8	1.8
	90	2.1	2.1	2.1	2.1	2.1	2.1	2.1
	100	2.3	2.3	2.3	2.3	2.3	2.3	2.3
	110	2.5	2.5	2.5	2.5	2.5	2.5	2.5
	120	2.8	2.8	2.8	2.8	2.8	2.8	2.8
	130	3.0	3.0	3.0	3.0	3.0	3.0	3.0
	≥140	3.2	3.2	3.2	3.2	3.2	3.2	3.2

Fastening screws for sandwich panels

Self-drilling screws ESPS-16-SP 6,3/5,5xL with hexagon head, washer S16 or A16 and saddle washer ESW

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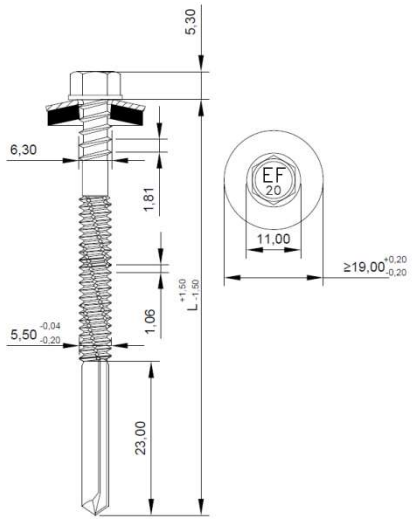
of European Technical Assessment ETA-16/0734

Materials

Fastener:	carbon steel – SAE1022, quenched, tempered and coated: galvanized (12 µm)
Washer:	Z19, Z22, Z25, Z29 – carbon steel washer with EPDM ring
Component I:	S280GD, S320GD or S350GD – EN 10346
Component II:	S235 to S355 – EN 10025-1 S280GD, S320GD or S350GD – EN 10346

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

Timber substructures
no performance assessed



$t_{N,II}$ [mm]		4.00	5.00	6.00	8.00	10.00	12.00	16.00	19.00
$V_{R,k}$ [kN] for $t_{N,I}$ [mm]	0.40	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84
	0.50	1.72	1.72	1.72	1.72	1.72	1.72	1.72	1.72
	0.55	1.72	1.72	1.72	1.72	1.72	1.72	1.72	1.72
	0.60	1.72	1.72	1.72	1.72	1.72	1.72	1.72	1.72
	0.63	1.90	1.90	1.90	1.90	1.90	1.90	1.90	1.90
	0.70	1.99	1.99	1.99	1.99	1.99	1.99	1.99	1.99
	0.75	2.69	2.69	2.69	2.69	2.69	2.69	2.69	2.69
	0.88	2.69	2.69	2.69	2.69	2.69	2.69	2.69	2.69
	1.00	3.10	3.10	3.10	3.10	3.10	3.10	3.10	3.10
$N_{R,k}$ [kN] for $t_{N,I}$ [mm]	0.40	1.81	1.81	1.81	1.81	1.81	1.81	1.81	1.81
	0.50	4.14	4.14	4.14	4.14	4.14	4.14	4.14	4.14
	0.55	4.14	4.14	4.14	4.14	4.14	4.14	4.14	4.14
	0.60	4.14	4.14	4.14	4.14	4.14	4.14	4.14	4.14
	0.63	5.10	5.10	5.10	5.10	5.10	5.10	5.10	5.10
	0.70	5.50	5.50	5.50	5.50	5.50	5.50	5.50	5.50
	0.75	7.70	7.70	7.70	7.70	7.70	7.70	7.70	7.70
	0.88	7.70	7.70	7.70	7.70	7.70	7.70	7.70	7.70
	1.00	7.78	7.78	7.78	7.78	7.78	7.78	7.78	7.78
$N_{R\ II,k}$ [kN]		8.02	8.02	12.65	12.65	12.65	12.65	12.65	12.65
max. head displacement "u" depending on sandwich panel thickness [mm]	30	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7
	40	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9
	50	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2
	60	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4
	70	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6
	80	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8
	90	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1
	100	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3
	110	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5
	120	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8
	130	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
	≥140	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2

Fastening screws for sandwich panels

Self-drilling screws ESPS-20-Z 6,3/5,5xL with hexagon head and washer Z19, Z22, Z25 or Z29

Annex 68

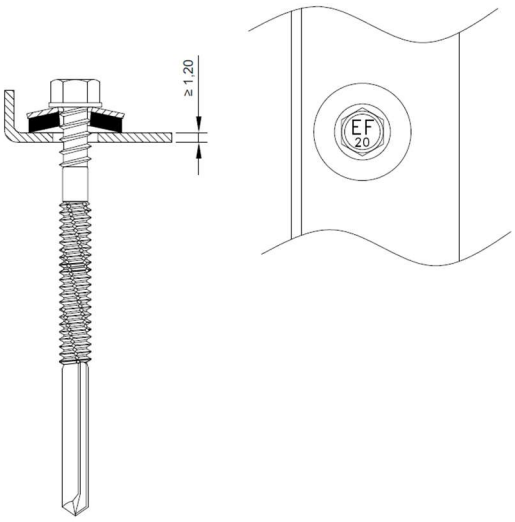
of European Technical Assessment ETA-16/0734

Materials

Fastener:	carbon steel – SAE1022, quenched, tempered and coated: galvanized (12 µm)
Washer:	Z19, Z22, Z25, Z29 – carbon steel washer with EPDM ring
Linear washer:	ELW-Z made of carbon steel – $R_{0,2} \geq 200$ MPa and galvanized min. 200 g/m² ELW-S made of stainless steel A2 – EN ISO 3506
Component I:	S280GD, S320GD or S350GD – EN 10346
Component II:	S235 to S355 – EN 10025-1 S280GD, S320GD or S350GD – EN 10346

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

Timber substructures
no performance assessed



$t_{N,II}$ [mm]		4.00	5.00	6.00	8.00	10.00	12.00	16.00	19.00
$V_{R,k}$ [kN] for $t_{N,I}$ [mm]	0.40	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84
	0.50	1.72	1.72	1.72	1.72	1.72	1.72	1.72	1.72
	0.55	1.72	1.72	1.72	1.72	1.72	1.72	1.72	1.72
	0.60	1.72	1.72	1.72	1.72	1.72	1.72	1.72	1.72
	0.63	1.90	1.90	1.90	1.90	1.90	1.90	1.90	1.90
	0.70	1.99	1.99	1.99	1.99	1.99	1.99	1.99	1.99
	0.75	2.69	2.69	2.69	2.69	2.69	2.69	2.69	2.69
	0.88	2.69	2.69	2.69	2.69	2.69	2.69	2.69	2.69
	1.00	3.10	3.10	3.10	3.10	3.10	3.10	3.10	3.10
$N_{R,k}$ [kN] for $t_{N,I}$ [mm]	0.40	7.78	7.78	7.78	7.78	7.78	7.78	7.78	7.78
	0.50	7.78	7.78	7.78	7.78	7.78	7.78	7.78	7.78
	0.55	7.78	7.78	7.78	7.78	7.78	7.78	7.78	7.78
	0.60	7.78	7.78	7.78	7.78	7.78	7.78	7.78	7.78
	0.63	7.78	7.78	7.78	7.78	7.78	7.78	7.78	7.78
	0.70	7.78	7.78	7.78	7.78	7.78	7.78	7.78	7.78
	0.75	7.78	7.78	7.78	7.78	7.78	7.78	7.78	7.78
	0.88	7.78	7.78	7.78	7.78	7.78	7.78	7.78	7.78
	1.00	7.78	7.78	7.78	7.78	7.78	7.78	7.78	7.78
$N_{R\ II,k}$ [kN]		8.02	8.02	12.65	12.65	12.65	12.65	12.65	12.65
max. head displacement "u" depending on sandwich panel thickness [mm]	30	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7
	40	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9
	50	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2
	60	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4
	70	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6
	80	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8
	90	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1
	100	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3
	110	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5
	120	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8
	130	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
	≥140	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2

Fastening screws for sandwich panels

Self-drilling screws ESPS-20-Z 6,3/5,5xL with hexagon head, washer Z19, Z22, Z25 or Z29 and linear washer ELW-Z or ELW-S

Annex 69

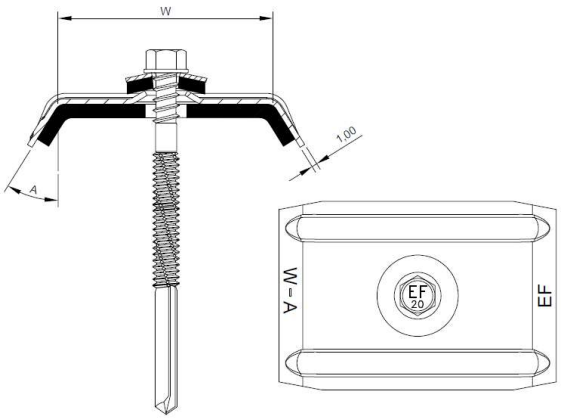
of European Technical Assessment ETA-16/0734

Materials

Fastener:	carbon steel – SAE1022, quenched, tempered and coated: galvanized (12 µm)
Washer:	Z19, Z22, Z25, Z29 – carbon steel washer with EPDM ring
Saddle washer:	ESW made of aluminum
Component I:	S280GD, S320GD or S350GD – EN 10346
Component II:	S235 to S355 – EN 10025-1 S280GD, S320GD or S350GD – EN 10346

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

Timber substructures
no performance assessed



$t_{N,II}$ [mm]		4.00	5.00	6.00	8.00	10.00	12.00	16.00	19.00
$V_{R,k}$ [kN] for $t_{N,I}$ [mm]	0.40	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84
	0.50	1.72	1.72	1.72	1.72	1.72	1.72	1.72	1.72
	0.55	1.72	1.72	1.72	1.72	1.72	1.72	1.72	1.72
	0.60	1.72	1.72	1.72	1.72	1.72	1.72	1.72	1.72
	0.63	1.90	1.90	1.90	1.90	1.90	1.90	1.90	1.90
	0.70	1.99	1.99	1.99	1.99	1.99	1.99	1.99	1.99
	0.75	2.69	2.69	2.69	2.69	2.69	2.69	2.69	2.69
	0.88	2.69	2.69	2.69	2.69	2.69	2.69	2.69	2.69
	1.00	3.10	3.10	3.10	3.10	3.10	3.10	3.10	3.10
$N_{R,k}$ [kN] for $t_{N,I}$ [mm]	0.40	8.02	8.02	10.14	10.14	10.14	10.14	10.14	10.14
	0.50	8.02	8.02	10.90	10.90	10.90	10.90	10.90	10.90
	0.55	8.02	8.02	10.90	10.90	10.90	10.90	10.90	10.90
	0.60	8.02	8.02	10.90	10.90	10.90	10.90	10.90	10.90
	0.63	8.02	8.02	10.90	10.90	10.90	10.90	10.90	10.90
	0.70	8.02	8.02	10.90	10.90	10.90	10.90	10.90	10.90
	0.75	8.02	8.02	10.90	10.90	10.90	10.90	10.90	10.90
	0.88	8.02	8.02	10.90	10.90	10.90	10.90	10.90	10.90
	1.00	8.02	8.02	10.90	10.90	10.90	10.90	10.90	10.90
$N_{R\ II,k}$ [kN]		8.02	8.02	12.65	12.65	12.65	12.65	12.65	12.65
max. head displacement "u" depending on sandwich panel thickness [mm]	30	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7
	40	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9
	50	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2
	60	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4
	70	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6
	80	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8
	90	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1
	100	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3
	110	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5
	120	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8
	130	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
	≥140	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2

Fastening screws for sandwich panels

Self-drilling screws ESPS-20-Z 6,3/5,5xL with hexagon head, washer Z19, Z22, Z25 or Z29 and saddle washer ESW

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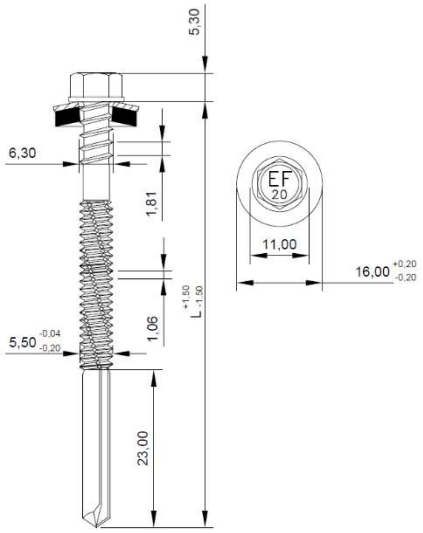
of European Technical Assessment ETA-16/0734

Materials

Fastener:	carbon steel – SAE1022, quenched, tempered and coated: galvanized (12 µm)
Washer:	Z16 – carbon steel washer with EPDM ring
Component I:	S280GD, S320GD or S350GD – EN 10346
Component II:	S235 to S355 – EN 10025-1 S280GD, S320GD or S350GD – EN 10346

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

Timber substructures
no performance assessed



$t_{N,II}$ [mm]		4.00	5.00	6.00	8.00	10.00	12.00	16.00	19.00
$V_{R,k}$ [kN] for $t_{N,I}$ [mm]	0.40	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84
	0.50	1.72	1.72	1.72	1.72	1.72	1.72	1.72	1.72
	0.55	1.72	1.72	1.72	1.72	1.72	1.72	1.72	1.72
	0.60	1.72	1.72	1.72	1.72	1.72	1.72	1.72	1.72
	0.63	1.90	1.90	1.90	1.90	1.90	1.90	1.90	1.90
	0.70	1.99	1.99	1.99	1.99	1.99	1.99	1.99	1.99
	0.75	2.69	2.69	2.69	2.69	2.69	2.69	2.69	2.69
	0.88	2.69	2.69	2.69	2.69	2.69	2.69	2.69	2.69
	1.00	3.10	3.10	3.10	3.10	3.10	3.10	3.10	3.10
$N_{R,k}$ [kN] for $t_{N,I}$ [mm]	0.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40
	0.50	2.53	2.53	2.53	2.53	2.53	2.53	2.53	2.53
	0.55	2.53	2.53	2.53	2.53	2.53	2.53	2.53	2.53
	0.60	2.77	2.77	2.77	2.77	2.77	2.77	2.77	2.77
	0.63	2.77	2.77	2.77	2.77	2.77	2.77	2.77	2.77
	0.70	2.89	2.89	2.89	2.89	2.89	2.89	2.89	2.89
	0.75	2.89	2.89	2.89	2.89	2.89	2.89	2.89	2.89
	0.88	2.89	2.89	2.89	2.89	2.89	2.89	2.89	2.89
	1.00	4.27	4.27	4.27	4.27	4.27	4.27	4.27	4.27
$N_{R\ II,k}$ [kN]		8.02	8.02	12.65	12.65	12.65	12.65	12.65	12.65
max. head displacement "u" depending on sandwich panel thickness [mm]	30	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7
	40	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9
	50	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2
	60	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4
	70	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6
	80	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8
	90	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1
	100	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3
	110	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5
	120	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8
	130	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
	≥140	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2

Fastening screws for sandwich panels

Self-drilling screws ESPS-20-Z 6,3/5,5xL with hexagon head and washer Z16

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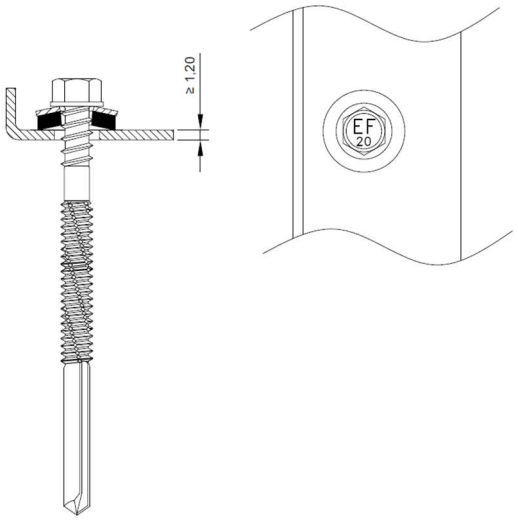
of European Technical Assessment ETA-16/0734

Materials

Fastener:	carbon steel – SAE1022, quenched, tempered and coated: galvanized (12 µm)
Washer:	Z16 – carbon steel washer with EPDM ring
Linear washer:	ELW-Z made of carbon steel – $R_{0,2} \geq 200$ MPa and galvanized min. 200 g/m^2 ELW-S made of stainless steel A2 – EN ISO 3506
Component I:	S280GD, S320GD or S350GD – EN 10346
Component II:	S235 to S355 – EN 10025-1 S280GD, S320GD or S350GD – EN 10346

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

Timber substructures
no performance assessed



$t_{N,II}$ [mm]		4.00	5.00	6.00	8.00	10.00	12.00	16.00	19.00
$V_{R,k}$ [kN] for $t_{N,I}$ [mm]	0.40	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84
	0.50	1.72	1.72	1.72	1.72	1.72	1.72	1.72	1.72
	0.55	1.72	1.72	1.72	1.72	1.72	1.72	1.72	1.72
	0.60	1.72	1.72	1.72	1.72	1.72	1.72	1.72	1.72
	0.63	1.90	1.90	1.90	1.90	1.90	1.90	1.90	1.90
	0.70	1.99	1.99	1.99	1.99	1.99	1.99	1.99	1.99
	0.75	2.69	2.69	2.69	2.69	2.69	2.69	2.69	2.69
	0.88	2.69	2.69	2.69	2.69	2.69	2.69	2.69	2.69
	1.00	3.10	3.10	3.10	3.10	3.10	3.10	3.10	3.10
$N_{R,k}$ [kN] for $t_{N,I}$ [mm]	0.40	8.02	8.02	12.02	12.02	12.02	12.02	12.02	12.02
	0.50	8.02	8.02	12.02	12.02	12.02	12.02	12.02	12.02
	0.55	8.02	8.02	12.02	12.02	12.02	12.02	12.02	12.02
	0.60	8.02	8.02	12.02	12.02	12.02	12.02	12.02	12.02
	0.63	8.02	8.02	12.02	12.02	12.02	12.02	12.02	12.02
	0.70	8.02	8.02	12.02	12.02	12.02	12.02	12.02	12.02
	0.75	8.02	8.02	12.02	12.02	12.02	12.02	12.02	12.02
	0.88	8.02	8.02	12.02	12.02	12.02	12.02	12.02	12.02
	1.00	8.02	8.02	12.02	12.02	12.02	12.02	12.02	12.02
$N_{R\ II,k}$ [kN]		8.02	8.02	12.65	12.65	12.65	12.65	12.65	12.65
max. head displacement "u" depending on sandwich panel thickness [mm]	30	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7
	40	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9
	50	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2
	60	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4
	70	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6
	80	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8
	90	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1
	100	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3
	110	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5
	120	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8
	130	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
	≥140	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2

Fastening screws for sandwich panels

Self-drilling screws ESPS-20-Z 6,3/5,5xL with hexagon head, washer Z16 and linear washer ELW-Z or ELW-S

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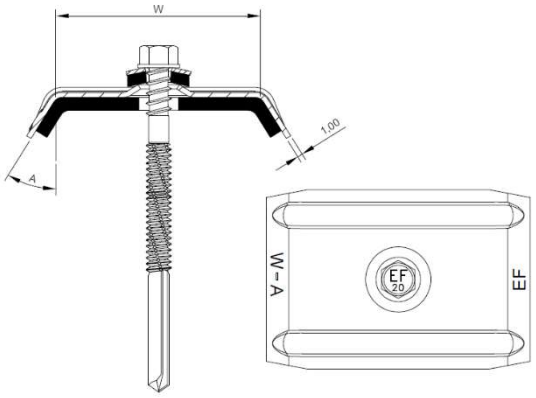
of European Technical Assessment ETA-16/0734

Materials

Fastener:	carbon steel – SAE1022, quenched, tempered and coated: galvanized (12 µm)
Washer:	Z16 – carbon steel washer with EPDM ring
Saddle washer:	ESW made of aluminum
Component I:	S280GD, S320GD or S350GD – EN 10346
Component II:	S235 to S355 – EN 10025-1 S280GD, S320GD or S350GD – EN 10346

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

Timber substructures
no performance assessed



$t_{N,II}$ [mm]		4.00	5.00	6.00	8.00	10.00	12.00	16.00	19.00
$V_{R,k}$ [kN] for $t_{N,I}$ [mm]	0.40	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84
	0.50	1.72	1.72	1.72	1.72	1.72	1.72	1.72	1.72
	0.55	1.72	1.72	1.72	1.72	1.72	1.72	1.72	1.72
	0.60	1.72	1.72	1.72	1.72	1.72	1.72	1.72	1.72
	0.63	1.90	1.90	1.90	1.90	1.90	1.90	1.90	1.90
	0.70	1.99	1.99	1.99	1.99	1.99	1.99	1.99	1.99
	0.75	2.69	2.69	2.69	2.69	2.69	2.69	2.69	2.69
	0.88	2.69	2.69	2.69	2.69	2.69	2.69	2.69	2.69
	1.00	3.10	3.10	3.10	3.10	3.10	3.10	3.10	3.10
$N_{R,k}$ [kN] for $t_{N,I}$ [mm]	0.40	8.02	8.02	10.53	10.53	10.53	10.53	10.53	10.53
	0.50	8.02	8.02	10.92	10.92	10.92	10.92	10.92	10.92
	0.55	8.02	8.02	10.92	10.92	10.92	10.92	10.92	10.92
	0.60	8.02	8.02	10.92	10.92	10.92	10.92	10.92	10.92
	0.63	8.02	8.02	10.92	10.92	10.92	10.92	10.92	10.92
	0.70	8.02	8.02	10.92	10.92	10.92	10.92	10.92	10.92
	0.75	8.02	8.02	10.92	10.92	10.92	10.92	10.92	10.92
	0.88	8.02	8.02	10.92	10.92	10.92	10.92	10.92	10.92
	1.00	8.02	8.02	10.92	10.92	10.92	10.92	10.92	10.92
$N_{R\ II,k}$ [kN]		8.02	8.02	12.65	12.65	12.65	12.65	12.65	12.65
max. head displacement "u" depending on sandwich panel thickness [mm]	30	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7
	40	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9
	50	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2
	60	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4
	70	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6
	80	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8
	90	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1
	100	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3
	110	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5
	120	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8
	130	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
	≥140	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2

Fastening screws for sandwich panels

Self-drilling screws ESPS-20-Z 6,3/5,5xL with hexagon head, washer Z16 and saddle washer ESW

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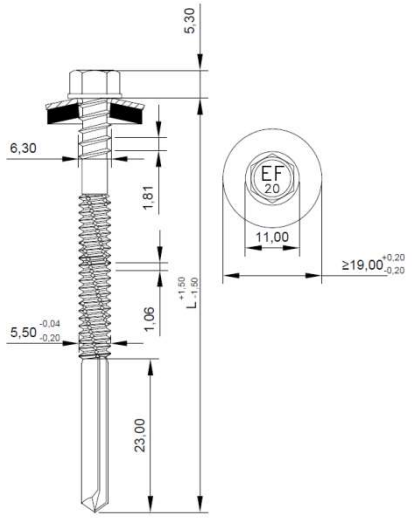
of European Technical Assessment ETA-16/0734

Materials

Fastener:	carbon steel – SAE1022, quenched, tempered and coated: galvanized with PREMIUM coating
Washer:	A19, A22, A25, A29 – aluminum washer with EPDM ring
Component I:	S280GD, S320GD or S350GD – EN 10346
Component II:	S235 to S355 – EN 10025-1 S280GD, S320GD or S350GD – EN 10346

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

Timber substructures
no performance assessed



$t_{N,II}$ [mm]		4.00	5.00	6.00	8.00	10.00	12.00	16.00	19.00
$V_{R,k}$ [kN] for $t_{N,I}$ [mm]	0.40	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84
	0.50	1.72	1.72	1.72	1.72	1.72	1.72	1.72	1.72
	0.55	1.72	1.72	1.72	1.72	1.72	1.72	1.72	1.72
	0.60	1.72	1.72	1.72	1.72	1.72	1.72	1.72	1.72
	0.63	1.90	1.90	1.90	1.90	1.90	1.90	1.90	1.90
	0.70	1.99	1.99	1.99	1.99	1.99	1.99	1.99	1.99
	0.75	2.69	2.69	2.69	2.69	2.69	2.69	2.69	2.69
	0.88	2.69	2.69	2.69	2.69	2.69	2.69	2.69	2.69
	1.00	3.10	3.10	3.10	3.10	3.10	3.10	3.10	3.10
$N_{R,k}$ [kN] for $t_{N,I}$ [mm]	0.40	1.81	1.81	1.81	1.81	1.81	1.81	1.81	1.81
	0.50	4.14	4.14	4.14	4.14	4.14	4.14	4.14	4.14
	0.55	4.14	4.14	4.14	4.14	4.14	4.14	4.14	4.14
	0.60	4.14	4.14	4.14	4.14	4.14	4.14	4.14	4.14
	0.63	5.10	5.10	5.10	5.10	5.10	5.10	5.10	5.10
	0.70	5.50	5.50	5.50	5.50	5.50	5.50	5.50	5.50
	0.75	7.70	7.70	7.70	7.70	7.70	7.70	7.70	7.70
	0.88	7.70	7.70	7.70	7.70	7.70	7.70	7.70	7.70
	1.00	7.78	7.78	7.78	7.78	7.78	7.78	7.78	7.78
$N_{R\ II,k}$ [kN]		8.02	8.02	12.65	12.65	12.65	12.65	12.65	12.65
max. head displacement "u" depending on sandwich panel thickness [mm]	30	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7
	40	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9
	50	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2
	60	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4
	70	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6
	80	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8
	90	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1
	100	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3
	110	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5
	120	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8
	130	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
	≥140	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2

Fastening screws for sandwich panels

Self-drilling screws ESPS-20-P 6,3/5,5xL with hexagon head and washer A19, A22, A25 or A29

Annex 74

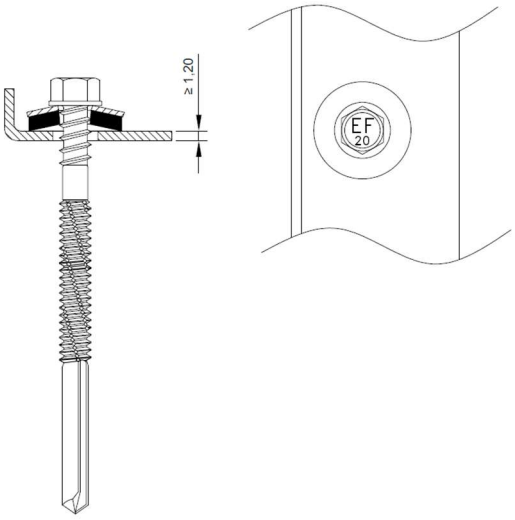
of European Technical Assessment ETA-16/0734

Materials

Fastener:	carbon steel – SAE1022, quenched, tempered and coated: galvanized with PREMIUM coating
Washer:	A19, A22, A25, A29 – aluminum washer with EPDM ring
Linear washer:	ELW-Z made of carbon steel – $R_{0,2} \geq 200$ MPa and galvanized min. 200 g/m^2 ELW-S made of stainless steel A2 – EN ISO 3506
Component I:	S280GD, S320GD or S350GD – EN 10346
Component II:	S235 to S355 – EN 10025-1 S280GD, S320GD or S350GD – EN 10346

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

Timber substructures
no performance assessed



$t_{N,II}$ [mm]		4.00	5.00	6.00	8.00	10.00	12.00	16.00	19.00
$V_{R,k}$ [kN] for $t_{N,I}$ [mm]	0.40	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84
	0.50	1.72	1.72	1.72	1.72	1.72	1.72	1.72	1.72
	0.55	1.72	1.72	1.72	1.72	1.72	1.72	1.72	1.72
	0.60	1.72	1.72	1.72	1.72	1.72	1.72	1.72	1.72
	0.63	1.90	1.90	1.90	1.90	1.90	1.90	1.90	1.90
	0.70	1.99	1.99	1.99	1.99	1.99	1.99	1.99	1.99
	0.75	2.69	2.69	2.69	2.69	2.69	2.69	2.69	2.69
	0.88	2.69	2.69	2.69	2.69	2.69	2.69	2.69	2.69
	1.00	3.10	3.10	3.10	3.10	3.10	3.10	3.10	3.10
$N_{R,k}$ [kN] for $t_{N,I}$ [mm]	0.40	7.78	7.78	7.78	7.78	7.78	7.78	7.78	7.78
	0.50	7.78	7.78	7.78	7.78	7.78	7.78	7.78	7.78
	0.55	7.78	7.78	7.78	7.78	7.78	7.78	7.78	7.78
	0.60	7.78	7.78	7.78	7.78	7.78	7.78	7.78	7.78
	0.63	7.78	7.78	7.78	7.78	7.78	7.78	7.78	7.78
	0.70	7.78	7.78	7.78	7.78	7.78	7.78	7.78	7.78
	0.75	7.78	7.78	7.78	7.78	7.78	7.78	7.78	7.78
	0.88	7.78	7.78	7.78	7.78	7.78	7.78	7.78	7.78
	1.00	7.78	7.78	7.78	7.78	7.78	7.78	7.78	7.78
$N_{R\ II,k}$ [kN]		8.02	8.02	12.65	12.65	12.65	12.65	12.65	12.65
max. head displacement "u" depending on sandwich panel thickness [mm]	30	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7
	40	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9
	50	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2
	60	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4
	70	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6
	80	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8
	90	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1
	100	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3
	110	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5
	120	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8
	130	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
	≥140	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2

Fastening screws for sandwich panels

Self-drilling screws ESPS-20-P 6,3/5,5xL with hexagon head, washer A19, A22, A25 or A29 and linear washer ELW-Z or ELW-S

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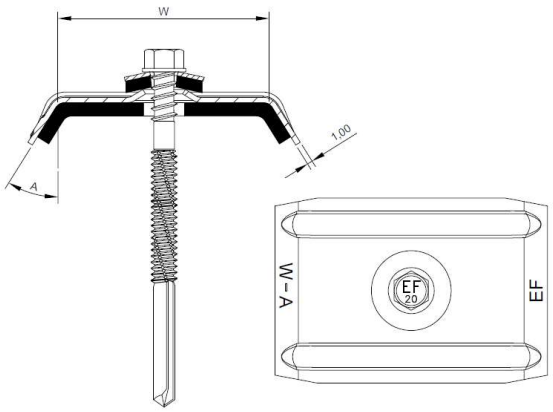
of European Technical Assessment ETA-16/0734

Materials

Fastener:	carbon steel – SAE1022, quenched, tempered and coated: galvanized with PREMIUM coating
Washer:	A19, A22, A25, A29 – aluminum washer with EPDM ring
Saddle washer:	ESW made of aluminum
Component I:	S280GD, S320GD or S350GD – EN 10346
Component II:	S235 to S355 – EN 10025-1 S280GD, S320GD or S350GD – EN 10346

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

Timber substructures
no performance assessed



$t_{N,II}$ [mm]		4.00	5.00	6.00	8.00	10.00	12.00	16.00	19.00
$V_{R,k}$ [kN] for $t_{N,I}$ [mm]	0.40	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84
	0.50	1.72	1.72	1.72	1.72	1.72	1.72	1.72	1.72
	0.55	1.72	1.72	1.72	1.72	1.72	1.72	1.72	1.72
	0.60	1.72	1.72	1.72	1.72	1.72	1.72	1.72	1.72
	0.63	1.90	1.90	1.90	1.90	1.90	1.90	1.90	1.90
	0.70	1.99	1.99	1.99	1.99	1.99	1.99	1.99	1.99
	0.75	2.69	2.69	2.69	2.69	2.69	2.69	2.69	2.69
	0.88	2.69	2.69	2.69	2.69	2.69	2.69	2.69	2.69
	1.00	3.10	3.10	3.10	3.10	3.10	3.10	3.10	3.10
$N_{R,k}$ [kN] for $t_{N,I}$ [mm]	0.40	8.02	8.02	10.14	10.14	10.14	10.14	10.14	10.14
	0.50	8.02	8.02	10.90	10.90	10.90	10.90	10.90	10.90
	0.55	8.02	8.02	10.90	10.90	10.90	10.90	10.90	10.90
	0.60	8.02	8.02	10.90	10.90	10.90	10.90	10.90	10.90
	0.63	8.02	8.02	10.90	10.90	10.90	10.90	10.90	10.90
	0.70	8.02	8.02	10.90	10.90	10.90	10.90	10.90	10.90
	0.75	8.02	8.02	10.90	10.90	10.90	10.90	10.90	10.90
	0.88	8.02	8.02	10.90	10.90	10.90	10.90	10.90	10.90
	1.00	8.02	8.02	10.90	10.90	10.90	10.90	10.90	10.90
$N_{R\ II,k}$ [kN]		8.02	8.02	12.65	12.65	12.65	12.65	12.65	12.65
max. head displacement "u" depending on sandwich panel thickness [mm]	30	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7
	40	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9
	50	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2
	60	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4
	70	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6
	80	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8
	90	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1
	100	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3
	110	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5
	120	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8
	130	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
	≥140	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2

Fastening screws for sandwich panels

Self-drilling screws ESPS-20-P 6,3/5,5xL with hexagon head, washer A19, A22, A25 or A29 and saddle washer ESW

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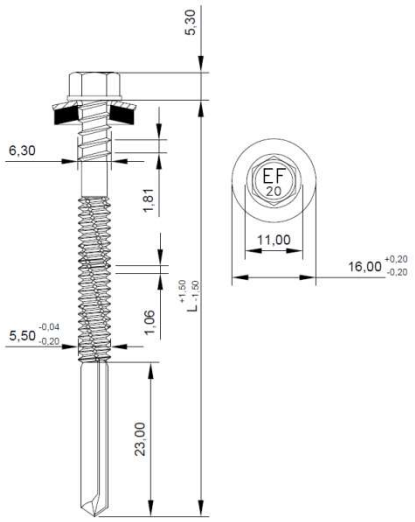
of European Technical Assessment ETA-16/0734

Materials

Fastener:	carbon steel – SAE1022, quenched, tempered and coated: galvanized with PREMIUM coating
Washer:	A16 – aluminum washer with EPDM ring
Component I:	S280GD, S320GD or S350GD – EN 10346
Component II:	S235 to S355 – EN 10025-1 S280GD, S320GD or S350GD – EN 10346

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

Timber substructures
no performance assessed



$t_{N,II}$ [mm]		4.00	5.00	6.00	8.00	10.00	12.00	16.00	19.00
$V_{R,k}$ [kN] for $t_{N,I}$ [mm]	0.40	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84
	0.50	1.72	1.72	1.72	1.72	1.72	1.72	1.72	1.72
	0.55	1.72	1.72	1.72	1.72	1.72	1.72	1.72	1.72
	0.60	1.72	1.72	1.72	1.72	1.72	1.72	1.72	1.72
	0.63	1.90	1.90	1.90	1.90	1.90	1.90	1.90	1.90
	0.70	1.99	1.99	1.99	1.99	1.99	1.99	1.99	1.99
	0.75	2.69	2.69	2.69	2.69	2.69	2.69	2.69	2.69
	0.88	2.69	2.69	2.69	2.69	2.69	2.69	2.69	2.69
	1.00	3.10	3.10	3.10	3.10	3.10	3.10	3.10	3.10
$N_{R,k}$ [kN] for $t_{N,I}$ [mm]	0.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40
	0.50	2.53	2.53	2.53	2.53	2.53	2.53	2.53	2.53
	0.55	2.53	2.53	2.53	2.53	2.53	2.53	2.53	2.53
	0.60	2.77	2.77	2.77	2.77	2.77	2.77	2.77	2.77
	0.63	2.77	2.77	2.77	2.77	2.77	2.77	2.77	2.77
	0.70	2.89	2.89	2.89	2.89	2.89	2.89	2.89	2.89
	0.75	2.89	2.89	2.89	2.89	2.89	2.89	2.89	2.89
	0.88	2.89	2.89	2.89	2.89	2.89	2.89	2.89	2.89
	1.00	4.27	4.27	4.27	4.27	4.27	4.27	4.27	4.27
$N_{R\ II,k}$ [kN]		8.02	8.02	12.65	12.65	12.65	12.65	12.65	12.65
max. head displacement "u" depending on sandwich panel thickness [mm]	30	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7
	40	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9
	50	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2
	60	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4
	70	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6
	80	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8
	90	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1
	100	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3
	110	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5
	120	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8
	130	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
	≥140	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2

Fastening screws for sandwich panels

Self-drilling screws ESPS-20-P 6,3/5,5xL with hexagon head and washer A16

Annex 77

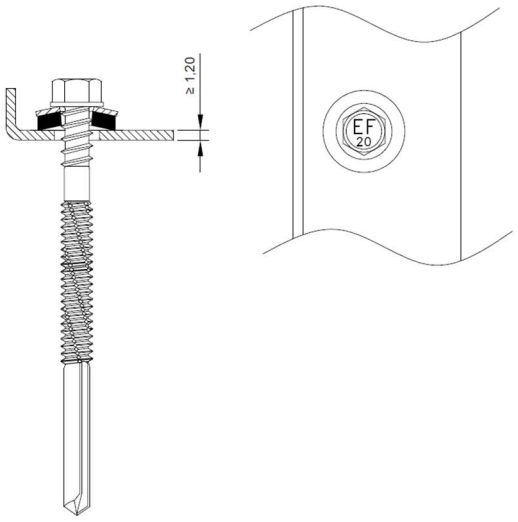
of European Technical Assessment ETA-16/0734

Materials

Fastener:	carbon steel – SAE1022, quenched, tempered and coated: galvanized with PREMIUM coating
Washer:	A16 – aluminum washer with EPDM ring
Linear washer:	ELW-Z made of carbon steel – $R_{0,2}$ ≥ 200 MPa and galvanized min. 200 g/m² ELW-S made of stainless steel A2 – EN ISO 3506
Component I:	S280GD, S320GD or S350GD – EN 10346
Component II:	S235 to S355 – EN 10025-1 S280GD, S320GD or S350GD – EN 10346

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

Timber substructures
no performance assessed



$t_{N,II}$ [mm]		4.00	5.00	6.00	8.00	10.00	12.00	16.00	19.00
$V_{R,k}$ [kN] for $t_{N,I}$ [mm]	0.40	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84
	0.50	1.72	1.72	1.72	1.72	1.72	1.72	1.72	1.72
	0.55	1.72	1.72	1.72	1.72	1.72	1.72	1.72	1.72
	0.60	1.72	1.72	1.72	1.72	1.72	1.72	1.72	1.72
	0.63	1.90	1.90	1.90	1.90	1.90	1.90	1.90	1.90
	0.70	1.99	1.99	1.99	1.99	1.99	1.99	1.99	1.99
	0.75	2.69	2.69	2.69	2.69	2.69	2.69	2.69	2.69
	0.88	2.69	2.69	2.69	2.69	2.69	2.69	2.69	2.69
	1.00	3.10	3.10	3.10	3.10	3.10	3.10	3.10	3.10
$N_{R,k}$ [kN] for $t_{N,I}$ [mm]	0.40	8.02	8.02	12.02	12.02	12.02	12.02	12.02	12.02
	0.50	8.02	8.02	12.02	12.02	12.02	12.02	12.02	12.02
	0.55	8.02	8.02	12.02	12.02	12.02	12.02	12.02	12.02
	0.60	8.02	8.02	12.02	12.02	12.02	12.02	12.02	12.02
	0.63	8.02	8.02	12.02	12.02	12.02	12.02	12.02	12.02
	0.70	8.02	8.02	12.02	12.02	12.02	12.02	12.02	12.02
	0.75	8.02	8.02	12.02	12.02	12.02	12.02	12.02	12.02
	0.88	8.02	8.02	12.02	12.02	12.02	12.02	12.02	12.02
	1.00	8.02	8.02	12.02	12.02	12.02	12.02	12.02	12.02
$N_{R\ II,k}$ [kN]		8.02	8.02	12.65	12.65	12.65	12.65	12.65	12.65
max. head displacement "u" depending on sandwich panel thickness [mm]	30	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7
	40	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9
	50	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2
	60	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4
	70	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6
	80	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8
	90	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1
	100	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3
	110	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5
	120	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8
	130	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
	≥140	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2

Fastening screws for sandwich panels

Self-drilling screws ESPS-20-P 6,3/5,5xL with hexagon head, washer A16 and linear washer ELW-Z or ELW-S

Annex 78

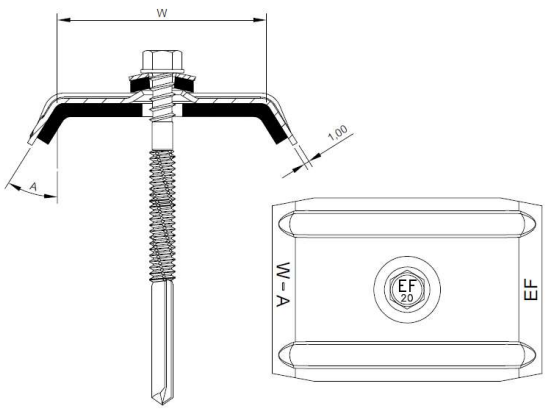
of European Technical Assessment ETA-16/0734

Materials

Fastener:	carbon steel – SAE1022, quenched, tempered and coated: galvanized with PREMIUM coating
Washer:	A16 – aluminum washer with EPDM ring
Saddle washer:	ESW made of aluminum
Component I:	S280GD, S320GD or S350GD – EN 10346
Component II:	S235 to S355 – EN 10025-1 S280GD, S320GD or S350GD – EN 10346

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

Timber substructures
no performance assessed



$t_{N,II}$ [mm]		4.00	5.00	6.00	8.00	10.00	12.00	16.00	19.00
$V_{R,k}$ [kN] for $t_{N,I}$ [mm]	0.40	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84
	0.50	1.72	1.72	1.72	1.72	1.72	1.72	1.72	1.72
	0.55	1.72	1.72	1.72	1.72	1.72	1.72	1.72	1.72
	0.60	1.72	1.72	1.72	1.72	1.72	1.72	1.72	1.72
	0.63	1.90	1.90	1.90	1.90	1.90	1.90	1.90	1.90
	0.70	1.99	1.99	1.99	1.99	1.99	1.99	1.99	1.99
	0.75	2.69	2.69	2.69	2.69	2.69	2.69	2.69	2.69
	0.88	2.69	2.69	2.69	2.69	2.69	2.69	2.69	2.69
	1.00	3.10	3.10	3.10	3.10	3.10	3.10	3.10	3.10
$N_{R,k}$ [kN] for $t_{N,I}$ [mm]	0.40	8.02	8.02	10.53	10.53	10.53	10.53	10.53	10.53
	0.50	8.02	8.02	10.92	10.92	10.92	10.92	10.92	10.92
	0.55	8.02	8.02	10.92	10.92	10.92	10.92	10.92	10.92
	0.60	8.02	8.02	10.92	10.92	10.92	10.92	10.92	10.92
	0.63	8.02	8.02	10.92	10.92	10.92	10.92	10.92	10.92
	0.70	8.02	8.02	10.92	10.92	10.92	10.92	10.92	10.92
	0.75	8.02	8.02	10.92	10.92	10.92	10.92	10.92	10.92
	0.88	8.02	8.02	10.92	10.92	10.92	10.92	10.92	10.92
	1.00	8.02	8.02	10.92	10.92	10.92	10.92	10.92	10.92
$N_{R\ II,k}$ [kN]		8.02	8.02	12.65	12.65	12.65	12.65	12.65	12.65
max. head displacement "u" depending on sandwich panel thickness [mm]	30	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7
	40	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9
	50	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2
	60	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4
	70	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6
	80	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8
	90	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1
	100	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3
	110	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5
	120	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8
	130	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
	≥140	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2

Fastening screws for sandwich panels

Self-drilling screws ESPS-20-P 6,3/5,5xL with hexagon head, washer A16 and saddle washer ESW

Annex 79

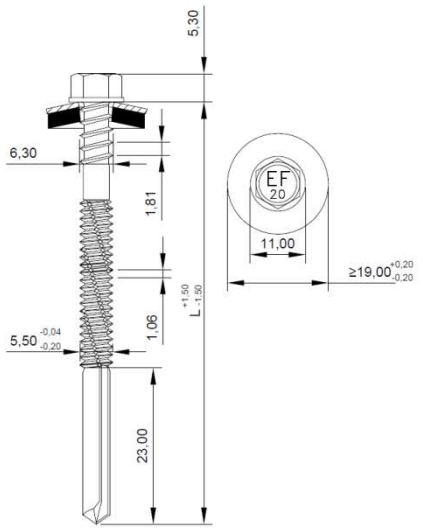
of European Technical Assessment ETA-16/0734

Materials

Fastener:	carbon steel – SAE1022, quenched, tempered and coated: galvanized with SUPER PREMIUM coating
Washer:	S19, S22, S25, S29 – stainless steel washer with EPDM ring or A19, A22, A25, A29 – aluminum washer with EPDM ring
Component I:	S280GD, S320GD or S350GD – EN 10346
Component II:	S235 to S355 – EN 10025-1 S280GD, S320GD or S350GD – EN 10346

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

Timber substructures
no performance assessed



$t_{N,II}$ [mm]		4.00	5.00	6.00	8.00	10.00	12.00	16.00	19.00
$V_{R,k}$ [kN] for $t_{N,I}$ [mm]	0.40	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84
	0.50	1.72	1.72	1.72	1.72	1.72	1.72	1.72	1.72
	0.55	1.72	1.72	1.72	1.72	1.72	1.72	1.72	1.72
	0.60	1.72	1.72	1.72	1.72	1.72	1.72	1.72	1.72
	0.63	1.90	1.90	1.90	1.90	1.90	1.90	1.90	1.90
	0.70	1.99	1.99	1.99	1.99	1.99	1.99	1.99	1.99
	0.75	2.69	2.69	2.69	2.69	2.69	2.69	2.69	2.69
	0.88	2.69	2.69	2.69	2.69	2.69	2.69	2.69	2.69
	1.00	3.10	3.10	3.10	3.10	3.10	3.10	3.10	3.10
$N_{R,k}$ [kN] for $t_{N,I}$ [mm]	0.40	1.81	1.81	1.81	1.81	1.81	1.81	1.81	1.81
	0.50	4.14	4.14	4.14	4.14	4.14	4.14	4.14	4.14
	0.55	4.14	4.14	4.14	4.14	4.14	4.14	4.14	4.14
	0.60	4.14	4.14	4.14	4.14	4.14	4.14	4.14	4.14
	0.63	5.10	5.10	5.10	5.10	5.10	5.10	5.10	5.10
	0.70	5.50	5.50	5.50	5.50	5.50	5.50	5.50	5.50
	0.75	7.70	7.70	7.70	7.70	7.70	7.70	7.70	7.70
	0.88	7.70	7.70	7.70	7.70	7.70	7.70	7.70	7.70
	1.00	7.78	7.78	7.78	7.78	7.78	7.78	7.78	7.78
$N_{R\ II,k}$ [kN]		8.02	8.02	12.65	12.65	12.65	12.65	12.65	12.65
max. head displacement "u" depending on sandwich panel thickness [mm]	30	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7
	40	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9
	50	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2
	60	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4
	70	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6
	80	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8
	90	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1
	100	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3
	110	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5
	120	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8
	130	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
	≥140	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2

Fastening screws for sandwich panels

Self-drilling screws ESPS-20-SP 6,3/5,5xL with hexagon head, washer S19, S22, S25, S29, A19, A22, A25 or A29

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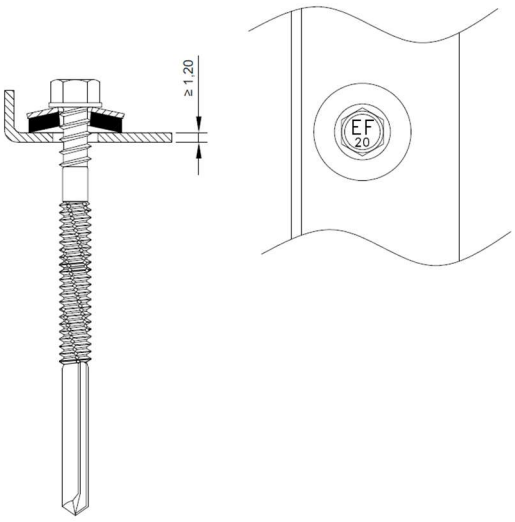
Materials

Fastener:	carbon steel – SAE1022, quenched, tempered and coated: galvanized with SUPER PREMIUM coating
Washer:	S19, S22, S25, S29 – stainless steel washer with EPDM ring or A19, A22, A25, A29 – aluminum washer with EPDM ring
Linear washer:	ELW-Z made of carbon steel – $R_{0,2} \geq 200$ MPa and galvanized min. 200 g/m^2 ELW-S made of stainless steel A2 – EN ISO 3506
Component I:	S280GD, S320GD or S350GD – EN 10346
Component II:	S235 to S355 – EN 10025-1 S280GD, S320GD or S350GD – EN 10346

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

Timber substructures
no performance assessed



$t_{N,II}$ [mm]		4.00	5.00	6.00	8.00	10.00	12.00	16.00	19.00
$V_{R,k}$ [kN] for $t_{N,I}$ [mm]	0.40	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84
	0.50	1.72	1.72	1.72	1.72	1.72	1.72	1.72	1.72
	0.55	1.72	1.72	1.72	1.72	1.72	1.72	1.72	1.72
	0.60	1.72	1.72	1.72	1.72	1.72	1.72	1.72	1.72
	0.63	1.90	1.90	1.90	1.90	1.90	1.90	1.90	1.90
	0.70	1.99	1.99	1.99	1.99	1.99	1.99	1.99	1.99
	0.75	2.69	2.69	2.69	2.69	2.69	2.69	2.69	2.69
	0.88	2.69	2.69	2.69	2.69	2.69	2.69	2.69	2.69
	1.00	3.10	3.10	3.10	3.10	3.10	3.10	3.10	3.10
$N_{R,k}$ [kN] for $t_{N,I}$ [mm]	0.40	7.78	7.78	7.78	7.78	7.78	7.78	7.78	7.78
	0.50	7.78	7.78	7.78	7.78	7.78	7.78	7.78	7.78
	0.55	7.78	7.78	7.78	7.78	7.78	7.78	7.78	7.78
	0.60	7.78	7.78	7.78	7.78	7.78	7.78	7.78	7.78
	0.63	7.78	7.78	7.78	7.78	7.78	7.78	7.78	7.78
	0.70	7.78	7.78	7.78	7.78	7.78	7.78	7.78	7.78
	0.75	7.78	7.78	7.78	7.78	7.78	7.78	7.78	7.78
	0.88	7.78	7.78	7.78	7.78	7.78	7.78	7.78	7.78
	1.00	7.78	7.78	7.78	7.78	7.78	7.78	7.78	7.78
$N_{R\ II,k}$ [kN]		8.02	8.02	12.65	12.65	12.65	12.65	12.65	12.65
max. head displacement "u" depending on sandwich panel thickness [mm]	30	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7
	40	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9
	50	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2
	60	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4
	70	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6
	80	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8
	90	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1
	100	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3
	110	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5
	120	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8
	130	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
	≥140	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2

Fastening screws for sandwich panels

Self-drilling screws ESPS-20-SP 6,3/5,5xL with hexagon head, washer S19, S22, S25, S29, A19, A22, A25 or A29 and linear washer ELW-Z or ELW-S

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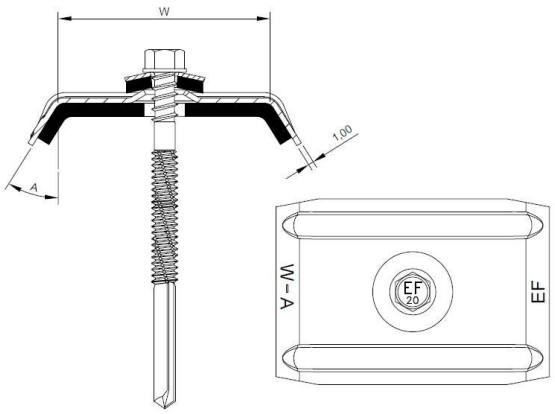
of European Technical Assessment ETA-16/0734

Materials

Fastener:	carbon steel – SAE1022, quenched, tempered and coated: galvanized with SUPER PREMIUM coating
Washer:	S19, S22, S25, S29 – stainless steel washer with EPDM ring or A19, A22, A25, A29 – aluminum washer with EPDM ring
Saddle washer:	ESW made of aluminum
Component I:	S280GD, S320GD or S350GD – EN 10346
Component II:	S235 to S355 – EN 10025-1 S280GD, S320GD or S350GD – EN 10346

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

Timber substructures
no performance assessed



$t_{N,II}$ [mm]		4.00	5.00	6.00	8.00	10.00	12.00	16.00	19.00
$V_{R,k}$ [kN] for $t_{N,I}$ [mm]	0.40	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84
	0.50	1.72	1.72	1.72	1.72	1.72	1.72	1.72	1.72
	0.55	1.72	1.72	1.72	1.72	1.72	1.72	1.72	1.72
	0.60	1.72	1.72	1.72	1.72	1.72	1.72	1.72	1.72
	0.63	1.90	1.90	1.90	1.90	1.90	1.90	1.90	1.90
	0.70	1.99	1.99	1.99	1.99	1.99	1.99	1.99	1.99
	0.75	2.69	2.69	2.69	2.69	2.69	2.69	2.69	2.69
	0.88	2.69	2.69	2.69	2.69	2.69	2.69	2.69	2.69
	1.00	3.10	3.10	3.10	3.10	3.10	3.10	3.10	3.10
$N_{R,k}$ [kN] for $t_{N,I}$ [mm]	0.40	8.02	8.02	10.14	10.14	10.14	10.14	10.14	10.14
	0.50	8.02	8.02	10.90	10.90	10.90	10.90	10.90	10.90
	0.55	8.02	8.02	10.90	10.90	10.90	10.90	10.90	10.90
	0.60	8.02	8.02	10.90	10.90	10.90	10.90	10.90	10.90
	0.63	8.02	8.02	10.90	10.90	10.90	10.90	10.90	10.90
	0.70	8.02	8.02	10.90	10.90	10.90	10.90	10.90	10.90
	0.75	8.02	8.02	10.90	10.90	10.90	10.90	10.90	10.90
	0.88	8.02	8.02	10.90	10.90	10.90	10.90	10.90	10.90
	1.00	8.02	8.02	10.90	10.90	10.90	10.90	10.90	10.90
$N_{R\ II,k}$ [kN]		8.02	8.02	12.65	12.65	12.65	12.65	12.65	12.65
max. head displacement "u" depending on sandwich panel thickness [mm]	30	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7
	40	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9
	50	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2
	60	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4
	70	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6
	80	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8
	90	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1
	100	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3
	110	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5
	120	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8
	130	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
	≥140	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2

Fastening screws for sandwich panels

Self-drilling screws ESPS-20-SP 6,3/5,5xL with hexagon head, washer S19, S22, S25, S29, A19, A22, A25 or A29 and saddle washer ESW

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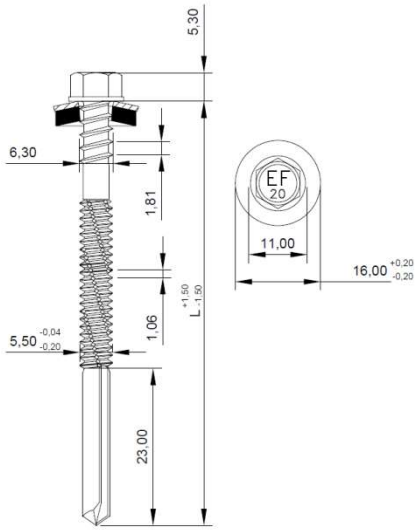
of European Technical Assessment ETA-16/0734

Materials

Fastener:	carbon steel – SAE1022, quenched, tempered and coated: galvanized with SUPER PREMIUM coating
Washer:	S16 – stainless steel washer with EPDM ring or A16 – aluminum washer with EPDM ring
Component I:	S280GD, S320GD or S350GD – EN 10346
Component II:	S235 to S355 – EN 10025-1 S280GD, S320GD or S350GD – EN 10346

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

Timber substructures
no performance assessed



$t_{N,II}$ [mm]		4.00	5.00	6.00	8.00	10.00	12.00	16.00	19.00
$V_{R,k}$ [kN] for $t_{N,I}$ [mm]	0.40	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84
	0.50	1.72	1.72	1.72	1.72	1.72	1.72	1.72	1.72
	0.55	1.72	1.72	1.72	1.72	1.72	1.72	1.72	1.72
	0.60	1.72	1.72	1.72	1.72	1.72	1.72	1.72	1.72
	0.63	1.90	1.90	1.90	1.90	1.90	1.90	1.90	1.90
	0.70	1.99	1.99	1.99	1.99	1.99	1.99	1.99	1.99
	0.75	2.69	2.69	2.69	2.69	2.69	2.69	2.69	2.69
	0.88	2.69	2.69	2.69	2.69	2.69	2.69	2.69	2.69
	1.00	3.10	3.10	3.10	3.10	3.10	3.10	3.10	3.10
$N_{R,k}$ [kN] for $t_{N,I}$ [mm]	0.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40
	0.50	2.53	2.53	2.53	2.53	2.53	2.53	2.53	2.53
	0.55	2.53	2.53	2.53	2.53	2.53	2.53	2.53	2.53
	0.60	2.77	2.77	2.77	2.77	2.77	2.77	2.77	2.77
	0.63	2.77	2.77	2.77	2.77	2.77	2.77	2.77	2.77
	0.70	2.89	2.89	2.89	2.89	2.89	2.89	2.89	2.89
	0.75	2.89	2.89	2.89	2.89	2.89	2.89	2.89	2.89
	0.88	2.89	2.89	2.89	2.89	2.89	2.89	2.89	2.89
	1.00	4.27	4.27	4.27	4.27	4.27	4.27	4.27	4.27
$N_{R\ II,k}$ [kN]		8.02	8.02	12.65	12.65	12.65	12.65	12.65	12.65
max. head displacement "u" depending on sandwich panel thickness [mm]	30	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7
	40	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9
	50	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2
	60	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4
	70	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6
	80	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8
	90	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1
	100	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3
	110	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5
	120	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8
	130	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
	≥140	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2

Fastening screws for sandwich panels

Self-drilling screws ESPS-20-SP 6,3/5,5xL with hexagon head and washer S16 or A16

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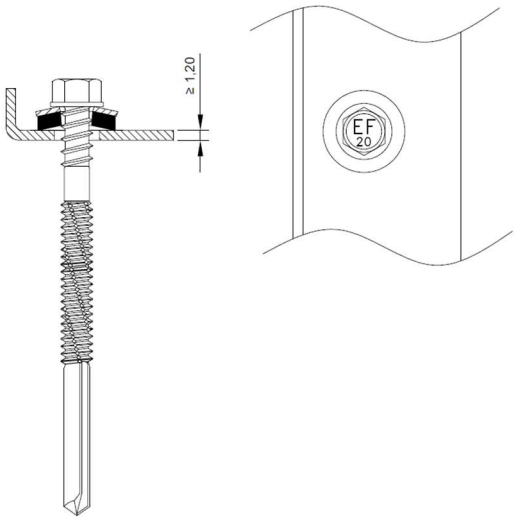
of European Technical Assessment ETA-16/0734

Materials

Fastener:	carbon steel – SAE1022, quenched, tempered and coated: galvanized with SUPER PREMIUM coating
Washer:	S16 – stainless steel washer with EPDM ring or A16 – aluminum washer with EPDM ring
Linear washer:	ELW-Z made of carbon steel – $R_{0,2} \geq 200$ MPa and galvanized min. 200 g/m^2 ELW-S made of stainless steel A2 – EN ISO 3506
Component I:	S280GD, S320GD or S350GD – EN 10346
Component II:	S235 to S355 – EN 10025-1 S280GD, S320GD or S350GD – EN 10346

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

Timber substructures
no performance assessed



$t_{N,II}$ [mm]		4.00	5.00	6.00	8.00	10.00	12.00	16.00	19.00
$V_{R,k}$ [kN] for $t_{N,I}$ [mm]	0.40	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84
	0.50	1.72	1.72	1.72	1.72	1.72	1.72	1.72	1.72
	0.55	1.72	1.72	1.72	1.72	1.72	1.72	1.72	1.72
	0.60	1.72	1.72	1.72	1.72	1.72	1.72	1.72	1.72
	0.63	1.90	1.90	1.90	1.90	1.90	1.90	1.90	1.90
	0.70	1.99	1.99	1.99	1.99	1.99	1.99	1.99	1.99
	0.75	2.69	2.69	2.69	2.69	2.69	2.69	2.69	2.69
	0.88	2.69	2.69	2.69	2.69	2.69	2.69	2.69	2.69
	1.00	3.10	3.10	3.10	3.10	3.10	3.10	3.10	3.10
$N_{R,k}$ [kN] for $t_{N,I}$ [mm]	0.40	8.02	8.02	12.02	12.02	12.02	12.02	12.02	12.02
	0.50	8.02	8.02	12.02	12.02	12.02	12.02	12.02	12.02
	0.55	8.02	8.02	12.02	12.02	12.02	12.02	12.02	12.02
	0.60	8.02	8.02	12.02	12.02	12.02	12.02	12.02	12.02
	0.63	8.02	8.02	12.02	12.02	12.02	12.02	12.02	12.02
	0.70	8.02	8.02	12.02	12.02	12.02	12.02	12.02	12.02
	0.75	8.02	8.02	12.02	12.02	12.02	12.02	12.02	12.02
	0.88	8.02	8.02	12.02	12.02	12.02	12.02	12.02	12.02
	1.00	8.02	8.02	12.02	12.02	12.02	12.02	12.02	12.02
$N_{R\ II,k}$ [kN]		8.02	8.02	12.65	12.65	12.65	12.65	12.65	12.65
max. head displacement "u" depending on sandwich panel thickness [mm]	30	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7
	40	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9
	50	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2
	60	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4
	70	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6
	80	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8
	90	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1
	100	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3
	110	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5
	120	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8
	130	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
	≥140	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2

Fastening screws for sandwich panels

Self-drilling screws ESPS-20-SP 6,3/5,5xL with hexagon head, washer S16 or A16 and linear washer ELW-Z or ELW-S

Annex 84

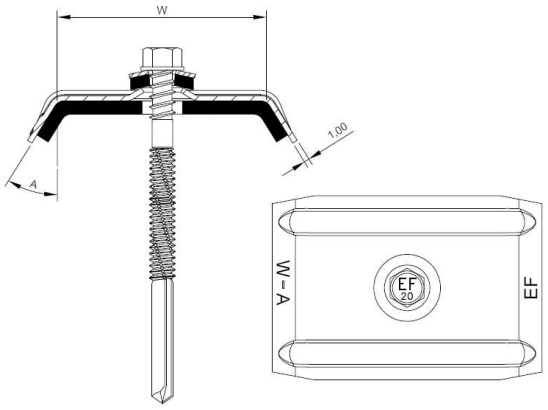
of European Technical Assessment ETA-16/0734

Materials

Fastener:	carbon steel – SAE1022, quenched, tempered and coated: galvanized with SUPER PREMIUM coating
Washer:	S16 – stainless steel washer with EPDM ring or A16 – aluminum washer with EPDM ring
Saddle washer:	ESW made of aluminum
Component I:	S280GD, S320GD or S350GD – EN 10346
Component II:	S235 to S355 – EN 10025-1 S280GD, S320GD or S350GD – EN 10346

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

Timber substructures
no performance assessed



$t_{N,II}$ [mm]		4.00	5.00	6.00	8.00	10.00	12.00	16.00	19.00
$V_{R,k}$ [kN] for $t_{N,I}$ [mm]	0.40	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84
	0.50	1.72	1.72	1.72	1.72	1.72	1.72	1.72	1.72
	0.55	1.72	1.72	1.72	1.72	1.72	1.72	1.72	1.72
	0.60	1.72	1.72	1.72	1.72	1.72	1.72	1.72	1.72
	0.63	1.90	1.90	1.90	1.90	1.90	1.90	1.90	1.90
	0.70	1.99	1.99	1.99	1.99	1.99	1.99	1.99	1.99
	0.75	2.69	2.69	2.69	2.69	2.69	2.69	2.69	2.69
	0.88	2.69	2.69	2.69	2.69	2.69	2.69	2.69	2.69
	1.00	3.10	3.10	3.10	3.10	3.10	3.10	3.10	3.10
$N_{R,k}$ [kN] for $t_{N,I}$ [mm]	0.40	8.02	8.02	10.53	10.53	10.53	10.53	10.53	10.53
	0.50	8.02	8.02	10.92	10.92	10.92	10.92	10.92	10.92
	0.55	8.02	8.02	10.92	10.92	10.92	10.92	10.92	10.92
	0.60	8.02	8.02	10.92	10.92	10.92	10.92	10.92	10.92
	0.63	8.02	8.02	10.92	10.92	10.92	10.92	10.92	10.92
	0.70	8.02	8.02	10.92	10.92	10.92	10.92	10.92	10.92
	0.75	8.02	8.02	10.92	10.92	10.92	10.92	10.92	10.92
	0.88	8.02	8.02	10.92	10.92	10.92	10.92	10.92	10.92
	1.00	8.02	8.02	10.92	10.92	10.92	10.92	10.92	10.92
$N_{R\ II,k}$ [kN]		8.02	8.02	12.65	12.65	12.65	12.65	12.65	12.65
max. head displacement "u" depending on sandwich panel thickness [mm]	30	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7
	40	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9
	50	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2
	60	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4
	70	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6
	80	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8
	90	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1
	100	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3
	110	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5
	120	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8
	130	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
	≥140	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2

Fastening screws for sandwich panels

Self-drilling screws ESPS-20-SP 6,3/5,5xL with hexagon head, washer S16 or A16 and saddle washer ESW

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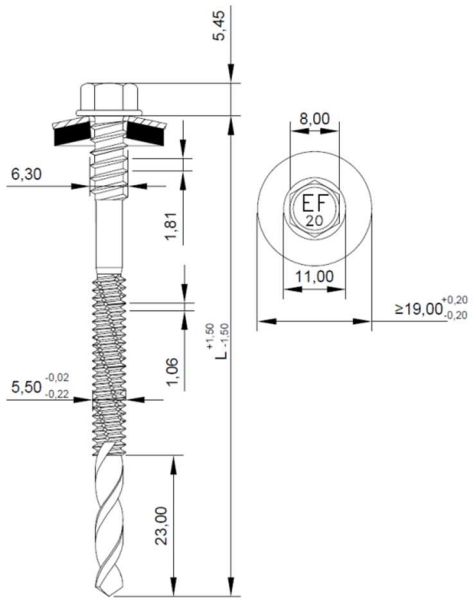
Materials

Fastener:	carbon steel – SAE1022, quenched, tempered and coated: galvanized (12 µm)
Washer:	Z19, Z22, Z25, Z29 – carbon steel washer with EPDM ring
Component I:	S280GD, S320GD or S320GD – EN 10346
Component II:	S235 to S355 – EN 10025-1 S280GD, S320GD or S350GD – EN 10346

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

Timber substructures
no performance assessed



$t_{N,II}$ [mm]		4.00	5.00	6.00	8.00	10.00	12.00	16.00	19.00
$V_{R,k}$ [kN] for $t_{N,I}$ [mm]	0.40	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84
	0.50	1.72	1.72	1.72	1.72	1.72	1.72	1.72	1.72
	0.55	1.72	1.72	1.72	1.72	1.72	1.72	1.72	1.72
	0.60	1.72	1.72	1.72	1.72	1.72	1.72	1.72	1.72
	0.63	1.90	1.90	1.90	1.90	1.90	1.90	1.90	1.90
	0.70	1.99	1.99	1.99	1.99	1.99	1.99	1.99	1.99
	0.75	2.69	2.69	2.69	2.69	2.69	2.69	2.69	2.69
	0.88	2.69	2.69	2.69	2.69	2.69	2.69	2.69	2.69
	1.00	3.10	3.10	3.10	3.10	3.10	3.10	3.10	3.10
$N_{R,k}$ [kN] for $t_{N,I}$ [mm]	0.40	1.81	1.81	1.81	1.81	1.81	1.81	1.81	1.81
	0.50	4.14	4.14	4.14	4.14	4.14	4.14	4.14	4.14
	0.55	4.14	4.14	4.14	4.14	4.14	4.14	4.14	4.14
	0.60	4.14	4.14	4.14	4.14	4.14	4.14	4.14	4.14
	0.63	5.10	5.10	5.10	5.10	5.10	5.10	5.10	5.10
	0.70	5.50	5.50	5.50	5.50	5.50	5.50	5.50	5.50
	0.75	7.70	7.70	7.70	7.70	7.70	7.70	7.70	7.70
	0.88	7.70	7.70	7.70	7.70	7.70	7.70	7.70	7.70
	1.00	7.78	7.78	7.78	7.78	7.78	7.78	7.78	7.78
$N_{R\ II,k}$ [kN]		8.02	8.02	12.65	12.65	12.65	12.65	12.65	12.65
max. head displacement "u" depending on sandwich panel thickness [mm]	30	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7
	40	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9
	50	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2
	60	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4
	70	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6
	80	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8
	90	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1
	100	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3
	110	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5
	120	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8
	130	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
	≥140	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2

Fastening screws for sandwich panels

Self-drilling screws ESPS-20S-Z 6,3/5,5xL with hexagon head and washer Z19, Z22, Z25 or Z29

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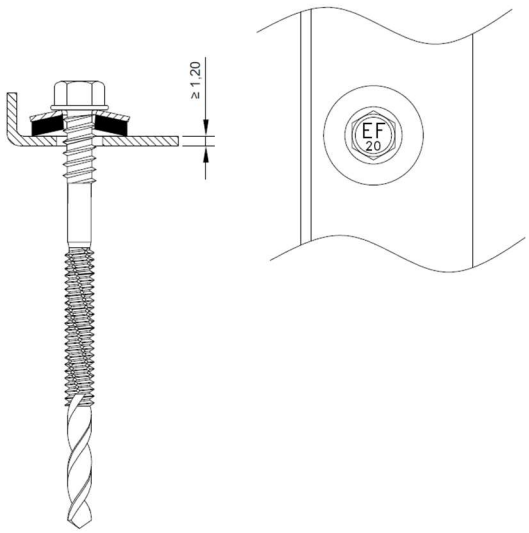
Materials

Fastener:	carbon steel – SAE1022, quenched, tempered and coated: galvanized (12 µm)
Washer:	Z19, Z22, Z25, Z29 – carbon steel washer with EPDM ring
Linear washer:	ELW-Z made of carbon steel – $R_{0,2} \geq 200$ MPa and galvanized min. 200 g/m^2 ELW-S made of stainless steel A2 – EN ISO 3506
Component I:	S280GD, S320GD or S350GD – EN 10346
Component II:	S235 to S355 – EN 10025-1 S280GD, S320GD or S350GD – EN 10346

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

Timber substructures
no performance assessed



$t_{N,II}$ [mm]		4.00	5.00	6.00	8.00	10.00	12.00	16.00	19.00
$V_{R,k}$ [kN] for $t_{N,I}$ [mm]	0.40	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84
	0.50	1.72	1.72	1.72	1.72	1.72	1.72	1.72	1.72
	0.55	1.72	1.72	1.72	1.72	1.72	1.72	1.72	1.72
	0.60	1.72	1.72	1.72	1.72	1.72	1.72	1.72	1.72
	0.63	1.90	1.90	1.90	1.90	1.90	1.90	1.90	1.90
	0.70	1.99	1.99	1.99	1.99	1.99	1.99	1.99	1.99
	0.75	2.69	2.69	2.69	2.69	2.69	2.69	2.69	2.69
	0.88	2.69	2.69	2.69	2.69	2.69	2.69	2.69	2.69
	1.00	3.10	3.10	3.10	3.10	3.10	3.10	3.10	3.10
$N_{R,k}$ [kN] for $t_{N,I}$ [mm]	0.40	7.78	7.78	7.78	7.78	7.78	7.78	7.78	7.78
	0.50	7.78	7.78	7.78	7.78	7.78	7.78	7.78	7.78
	0.55	7.78	7.78	7.78	7.78	7.78	7.78	7.78	7.78
	0.60	7.78	7.78	7.78	7.78	7.78	7.78	7.78	7.78
	0.63	7.78	7.78	7.78	7.78	7.78	7.78	7.78	7.78
	0.70	7.78	7.78	7.78	7.78	7.78	7.78	7.78	7.78
	0.75	7.78	7.78	7.78	7.78	7.78	7.78	7.78	7.78
	0.88	7.78	7.78	7.78	7.78	7.78	7.78	7.78	7.78
	1.00	7.78	7.78	7.78	7.78	7.78	7.78	7.78	7.78
$N_{R\ II,k}$ [kN]		8.02	8.02	12.65	12.65	12.65	12.65	12.65	12.65
max. head displacement "u" depending on sandwich panel thickness [mm]	30	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7
	40	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9
	50	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2
	60	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4
	70	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6
	80	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8
	90	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1
	100	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3
	110	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5
	120	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8
	130	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
	≥140	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2

Fastening screws for sandwich panels

Self-drilling screws ESPS-20S-Z 6,3/5,5xL with hexagon head, washer Z19, Z22, Z25 or Z29 and linear washer ELW-Z or ELW-S

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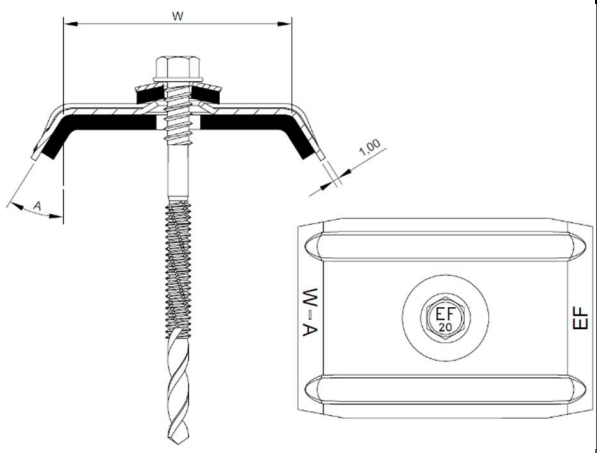
of European Technical Assessment ETA-16/0734

Materials

Fastener:	carbon steel – SAE1022, quenched, tempered and coated: galvanized (12 µm)
Washer:	Z19, Z22, Z25, Z29 – carbon steel washer with EPDM ring
Saddle washer:	ESW made of aluminum
Component I:	S280GD, S320GD or S350GD – EN 10346
Component II:	S235 to S355 – EN 10025-1 S280GD, S320GD or S350GD – EN 10346

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

Timber substructures
no performance assessed



$t_{N,II}$ [mm]		4.00	5.00	6.00	8.00	10.00	12.00	16.00	19.00
$V_{R,k}$ [kN] for $t_{N,I}$ [mm]	0.40	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84
	0.50	1.72	1.72	1.72	1.72	1.72	1.72	1.72	1.72
	0.55	1.72	1.72	1.72	1.72	1.72	1.72	1.72	1.72
	0.60	1.72	1.72	1.72	1.72	1.72	1.72	1.72	1.72
	0.63	1.90	1.90	1.90	1.90	1.90	1.90	1.90	1.90
	0.70	1.99	1.99	1.99	1.99	1.99	1.99	1.99	1.99
	0.75	2.69	2.69	2.69	2.69	2.69	2.69	2.69	2.69
	0.88	2.69	2.69	2.69	2.69	2.69	2.69	2.69	2.69
	1.00	3.10	3.10	3.10	3.10	3.10	3.10	3.10	3.10
$N_{R,k}$ [kN] for $t_{N,I}$ [mm]	0.40	8.02	8.02	10.14	10.14	10.14	10.14	10.14	10.14
	0.50	8.02	8.02	10.90	10.90	10.90	10.90	10.90	10.90
	0.55	8.02	8.02	10.90	10.90	10.90	10.90	10.90	10.90
	0.60	8.02	8.02	10.90	10.90	10.90	10.90	10.90	10.90
	0.63	8.02	8.02	10.90	10.90	10.90	10.90	10.90	10.90
	0.70	8.02	8.02	10.90	10.90	10.90	10.90	10.90	10.90
	0.75	8.02	8.02	10.90	10.90	10.90	10.90	10.90	10.90
	0.88	8.02	8.02	10.90	10.90	10.90	10.90	10.90	10.90
	1.00	8.02	8.02	10.90	10.90	10.90	10.90	10.90	10.90
$N_{R\ II,k}$ [kN]		8.02	8.02	12.65	12.65	12.65	12.65	12.65	12.65
max. head displacement "u" depending on sandwich panel thickness [mm]	30	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7
	40	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9
	50	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2
	60	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4
	70	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6
	80	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8
	90	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1
	100	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3
	110	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5
	120	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8
	130	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
	≥140	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2

Fastening screws for sandwich panels

Self-drilling screws ESPS-20S-Z 6,3/5,5xL with hexagon head, washer Z19, Z22, Z25 or Z29 and saddle washer ESW

Annex 88

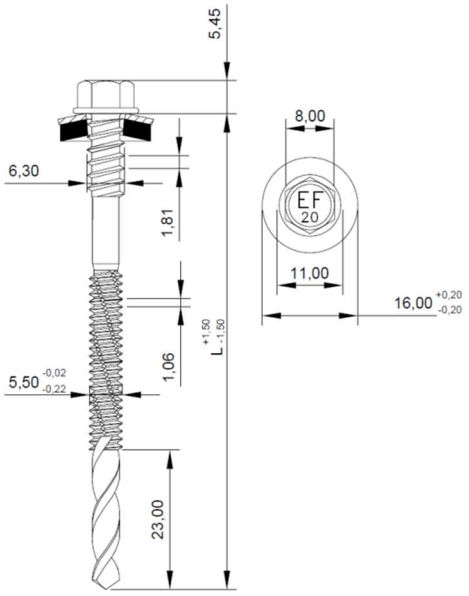
of European Technical Assessment ETA-16/0734

Materials

Fastener:	carbon steel – SAE1022, quenched, tempered and coated: galvanized (12 µm)
Washer:	Z16 – carbon steel washer with EPDM ring
Component I:	S280GD, S320GD or S350GD – EN 10346
Component II:	S235 to S355 – EN 10025-1 S280GD, S320GD or S350GD – EN 10346

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

Timber substructures
no performance assessed



$t_{N,II}$ [mm]		4.00	5.00	6.00	8.00	10.00	12.00	16.00	19.00
$V_{R,k}$ [kN] for $t_{N,I}$ [mm]	0.40	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84
	0.50	1.72	1.72	1.72	1.72	1.72	1.72	1.72	1.72
	0.55	1.72	1.72	1.72	1.72	1.72	1.72	1.72	1.72
	0.60	1.72	1.72	1.72	1.72	1.72	1.72	1.72	1.72
	0.63	1.90	1.90	1.90	1.90	1.90	1.90	1.90	1.90
	0.70	1.99	1.99	1.99	1.99	1.99	1.99	1.99	1.99
	0.75	2.69	2.69	2.69	2.69	2.69	2.69	2.69	2.69
	0.88	2.69	2.69	2.69	2.69	2.69	2.69	2.69	2.69
	1.00	3.10	3.10	3.10	3.10	3.10	3.10	3.10	3.10
$N_{R,k}$ [kN] for $t_{N,I}$ [mm]	0.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40
	0.50	2.53	2.53	2.53	2.53	2.53	2.53	2.53	2.53
	0.55	2.53	2.53	2.53	2.53	2.53	2.53	2.53	2.53
	0.60	2.77	2.77	2.77	2.77	2.77	2.77	2.77	2.77
	0.63	2.77	2.77	2.77	2.77	2.77	2.77	2.77	2.77
	0.70	2.89	2.89	2.89	2.89	2.89	2.89	2.89	2.89
	0.75	2.89	2.89	2.89	2.89	2.89	2.89	2.89	2.89
	0.88	2.89	2.89	2.89	2.89	2.89	2.89	2.89	2.89
	1.00	4.27	4.27	4.27	4.27	4.27	4.27	4.27	4.27
$N_{R\ II,k}$ [kN]		8.02	8.02	12.65	12.65	12.65	12.65	12.65	12.65
max. head displacement "u" depending on sandwich panel thickness [mm]	30	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7
	40	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9
	50	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2
	60	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4
	70	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6
	80	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8
	90	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1
	100	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3
	110	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5
	120	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8
	130	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
	≥140	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2

Fastening screws for sandwich panels

Self-drilling screws ESPS-20S-Z 6,3/5,5xL with hexagon head and washer Z16

Annex 89

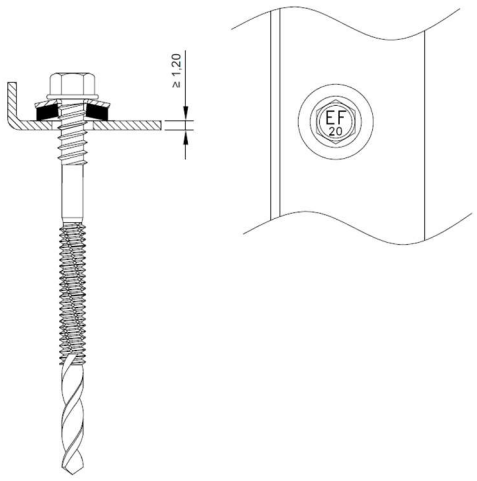
of European Technical Assessment ETA-16/0734

Materials

Fastener:	carbon steel – SAE1022, quenched, tempered and coated: galvanized (12 µm)
Washer:	Z16 – carbon steel washer with EPDM ring
Linear washer:	ELW-Z made of carbon steel – $R_{0,2}$ ≥ 200 MPa and galvanized min. 200 g/m^2 ELW-S made of stainless steel A2 – EN ISO 3506
Component I:	S280GD, S320GD or S350GD – EN 10346
Component II:	S235 to S355 – EN 10025-1 S280GD, S320GD or S350GD – EN 10346

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

Timber substructures
no performance assessed



$t_{N,II}$ [mm]		4.00	5.00	6.00	8.00	10.00	12.00	16.00	19.00
$V_{R,k}$ [kN] for $t_{N,I}$ [mm]	0.40	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84
	0.50	1.72	1.72	1.72	1.72	1.72	1.72	1.72	1.72
	0.55	1.72	1.72	1.72	1.72	1.72	1.72	1.72	1.72
	0.60	1.72	1.72	1.72	1.72	1.72	1.72	1.72	1.72
	0.63	1.90	1.90	1.90	1.90	1.90	1.90	1.90	1.90
	0.70	1.99	1.99	1.99	1.99	1.99	1.99	1.99	1.99
	0.75	2.69	2.69	2.69	2.69	2.69	2.69	2.69	2.69
	0.88	2.69	2.69	2.69	2.69	2.69	2.69	2.69	2.69
	1.00	3.10	3.10	3.10	3.10	3.10	3.10	3.10	3.10
$N_{R,k}$ [kN] for $t_{N,I}$ [mm]	0.40	8.02	8.02	12.02	12.02	12.02	12.02	12.02	12.02
	0.50	8.02	8.02	12.02	12.02	12.02	12.02	12.02	12.02
	0.55	8.02	8.02	12.02	12.02	12.02	12.02	12.02	12.02
	0.60	8.02	8.02	12.02	12.02	12.02	12.02	12.02	12.02
	0.63	8.02	8.02	12.02	12.02	12.02	12.02	12.02	12.02
	0.70	8.02	8.02	12.02	12.02	12.02	12.02	12.02	12.02
	0.75	8.02	8.02	12.02	12.02	12.02	12.02	12.02	12.02
	0.88	8.02	8.02	12.02	12.02	12.02	12.02	12.02	12.02
	1.00	8.02	8.02	12.02	12.02	12.02	12.02	12.02	12.02
$N_{R\ II,k}$ [kN]		8.02	8.02	12.65	12.65	12.65	12.65	12.65	12.65
max. head displacement "u" depending on sandwich panel thickness [mm]	30	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7
	40	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9
	50	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2
	60	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4
	70	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6
	80	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8
	90	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1
	100	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3
	110	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5
	120	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8
	130	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
	≥140	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2

Fastening screws for sandwich panels

Self-drilling screws ESPS-20S-Z 6,3/5,5xL with hexagon head, washer Z16 and linear washer ELW-Z or ELW-S

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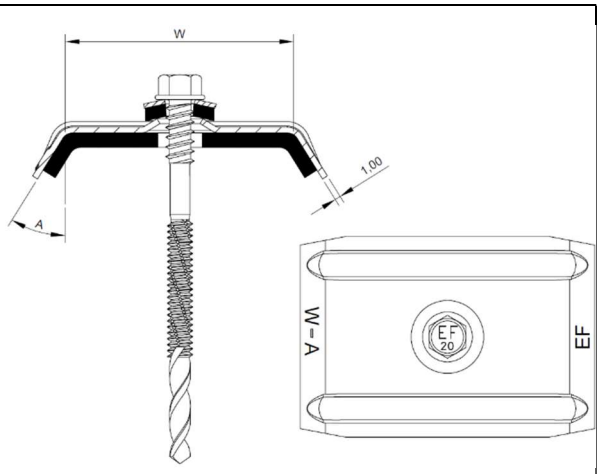
of European Technical Assessment ETA-16/0734

Materials

Fastener:	carbon steel – SAE1022, quenched, tempered and coated: galvanized (12 µm)
Washer:	Z16 – carbon steel washer with EPDM ring
Saddle washer:	ESW made of aluminum
Component I:	S280GD, S320GD or S350GD – EN 10346
Component II:	S235 to S355 – EN 10025-1 S280GD, S320GD or S350GD – EN 10346

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

Timber substructures
no performance assessed



$t_{N,II}$ [mm]		4.00	5.00	6.00	8.00	10.00	12.00	16.00	19.00
$V_{R,k}$ [kN] for $t_{N,I}$ [mm]	0.40	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84
	0.50	1.72	1.72	1.72	1.72	1.72	1.72	1.72	1.72
	0.55	1.72	1.72	1.72	1.72	1.72	1.72	1.72	1.72
	0.60	1.72	1.72	1.72	1.72	1.72	1.72	1.72	1.72
	0.63	1.90	1.90	1.90	1.90	1.90	1.90	1.90	1.90
	0.70	1.99	1.99	1.99	1.99	1.99	1.99	1.99	1.99
	0.75	2.69	2.69	2.69	2.69	2.69	2.69	2.69	2.69
	0.88	2.69	2.69	2.69	2.69	2.69	2.69	2.69	2.69
	1.00	3.10	3.10	3.10	3.10	3.10	3.10	3.10	3.10
$N_{R,k}$ [kN] for $t_{N,I}$ [mm]	0.40	8.02	8.02	10.53	10.53	10.53	10.53	10.53	10.53
	0.50	8.02	8.02	10.92	10.92	10.92	10.92	10.92	10.92
	0.55	8.02	8.02	10.92	10.92	10.92	10.92	10.92	10.92
	0.60	8.02	8.02	10.92	10.92	10.92	10.92	10.92	10.92
	0.63	8.02	8.02	10.92	10.92	10.92	10.92	10.92	10.92
	0.70	8.02	8.02	10.92	10.92	10.92	10.92	10.92	10.92
	0.75	8.02	8.02	10.92	10.92	10.92	10.92	10.92	10.92
	0.88	8.02	8.02	10.92	10.92	10.92	10.92	10.92	10.92
	1.00	8.02	8.02	10.92	10.92	10.92	10.92	10.92	10.92
$N_{R\,II,k}$ [kN]		8.02	8.02	12.65	12.65	12.65	12.65	12.65	12.65
max. head displacement "u" depending on sandwich panel thickness [mm]	30	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7
	40	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9
	50	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2
	60	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4
	70	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6
	80	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8
	90	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1
	100	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3
	110	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5
	120	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8
	130	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
	≥140	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2

Fastening screws for sandwich panels

Self-drilling screws ESPS-20S-Z 6,3/5,5xL with hexagon head, washer Z16 and saddle washer ESW

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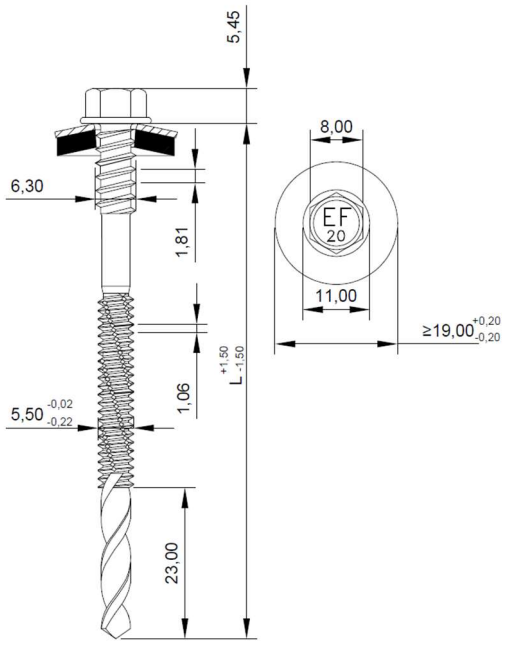
of European Technical Assessment ETA-16/0734

Materials

Fastener:	carbon steel – SAE1022, quenched, tempered and coated: galvanized with PREMIUM coating
Washer:	A19, A22, A25, A29 – aluminum washer with EPDM ring
Component I:	S280GD, S320GD or S350GD – EN 10346
Component II:	S235 to S355 – EN 10025-1 S280GD, S320GD or S350GD – EN 10346

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

Timber substructures
no performance assessed



$t_{N,II}$ [mm]		4.00	5.00	6.00	8.00	10.00	12.00	16.00	19.00
$V_{R,k}$ [kN] for $t_{N,I}$ [mm]	0.40	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84
	0.50	1.72	1.72	1.72	1.72	1.72	1.72	1.72	1.72
	0.55	1.72	1.72	1.72	1.72	1.72	1.72	1.72	1.72
	0.60	1.72	1.72	1.72	1.72	1.72	1.72	1.72	1.72
	0.63	1.90	1.90	1.90	1.90	1.90	1.90	1.90	1.90
	0.70	1.99	1.99	1.99	1.99	1.99	1.99	1.99	1.99
	0.75	2.69	2.69	2.69	2.69	2.69	2.69	2.69	2.69
	0.88	2.69	2.69	2.69	2.69	2.69	2.69	2.69	2.69
	1.00	3.10	3.10	3.10	3.10	3.10	3.10	3.10	3.10
$N_{R,k}$ [kN] for $t_{N,I}$ [mm]	0.40	1.81	1.81	1.81	1.81	1.81	1.81	1.81	1.81
	0.50	4.14	4.14	4.14	4.14	4.14	4.14	4.14	4.14
	0.55	4.14	4.14	4.14	4.14	4.14	4.14	4.14	4.14
	0.60	4.14	4.14	4.14	4.14	4.14	4.14	4.14	4.14
	0.63	5.10	5.10	5.10	5.10	5.10	5.10	5.10	5.10
	0.70	5.50	5.50	5.50	5.50	5.50	5.50	5.50	5.50
	0.75	7.70	7.70	7.70	7.70	7.70	7.70	7.70	7.70
	0.88	7.70	7.70	7.70	7.70	7.70	7.70	7.70	7.70
	1.00	7.78	7.78	7.78	7.78	7.78	7.78	7.78	7.78
$N_{R\ II,k}$ [kN]		8.02	8.02	12.65	12.65	12.65	12.65	12.65	12.65
max. head displacement "u" depending on sandwich panel thickness [mm]	30	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7
	40	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9
	50	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2
	60	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4
	70	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6
	80	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8
	90	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1
	100	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3
	110	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5
	120	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8
	130	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
	≥140	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2

Fastening screws for sandwich panels

Self-drilling screws ESPS-20S-P 6,3/5,5xL with hexagon head and washer A19, A22, A25 or A29

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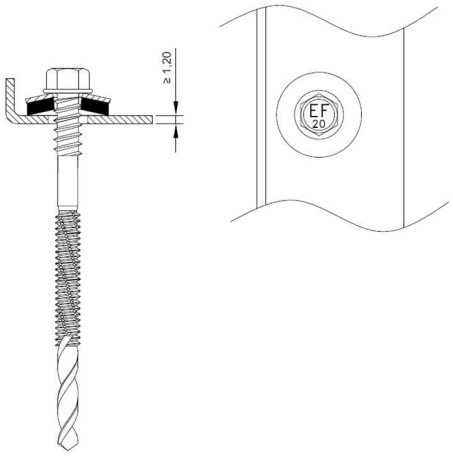
of European Technical Assessment ETA-16/0734

Materials

Fastener:	carbon steel – SAE1022, quenched, tempered and coated: galvanized with PREMIUM coating
Washer:	A19, A22, A25, A29 – aluminum washer with EPDM ring
Linear washer:	ELW-Z made of carbon steel – $R_{0,2} \geq 200$ MPa and galvanized min. 200 g/m^2 ELW-S made of stainless steel A2 – EN ISO 3506
Component I:	S280GD, S320GD or S350GD – EN 10346
Component II:	S235 to S355 – EN 10025-1 S280GD, S320GD or S350GD – EN 10346

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

Timber substructures
no performance assessed



$t_{N,II}$ [mm]		4.00	5.00	6.00	8.00	10.00	12.00	16.00	19.00
$V_{R,k}$ [kN] for $t_{N,I}$ [mm]	0.40	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84
	0.50	1.72	1.72	1.72	1.72	1.72	1.72	1.72	1.72
	0.55	1.72	1.72	1.72	1.72	1.72	1.72	1.72	1.72
	0.60	1.72	1.72	1.72	1.72	1.72	1.72	1.72	1.72
	0.63	1.90	1.90	1.90	1.90	1.90	1.90	1.90	1.90
	0.70	1.99	1.99	1.99	1.99	1.99	1.99	1.99	1.99
	0.75	2.69	2.69	2.69	2.69	2.69	2.69	2.69	2.69
	0.88	2.69	2.69	2.69	2.69	2.69	2.69	2.69	2.69
	1.00	3.10	3.10	3.10	3.10	3.10	3.10	3.10	3.10
$N_{R,k}$ [kN] for $t_{N,I}$ [mm]	0.40	7.78	7.78	7.78	7.78	7.78	7.78	7.78	7.78
	0.50	7.78	7.78	7.78	7.78	7.78	7.78	7.78	7.78
	0.55	7.78	7.78	7.78	7.78	7.78	7.78	7.78	7.78
	0.60	7.78	7.78	7.78	7.78	7.78	7.78	7.78	7.78
	0.63	7.78	7.78	7.78	7.78	7.78	7.78	7.78	7.78
	0.70	7.78	7.78	7.78	7.78	7.78	7.78	7.78	7.78
	0.75	7.78	7.78	7.78	7.78	7.78	7.78	7.78	7.78
	0.88	7.78	7.78	7.78	7.78	7.78	7.78	7.78	7.78
	1.00	7.78	7.78	7.78	7.78	7.78	7.78	7.78	7.78
$N_{R\ II,k}$ [kN]		8.02	8.02	12.65	12.65	12.65	12.65	12.65	12.65
max. head displacement "u" depending on sandwich panel thickness [mm]	30	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7
	40	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9
	50	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2
	60	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4
	70	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6
	80	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8
	90	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1
	100	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3
	110	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5
	120	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8
	130	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
	≥140	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2

Fastening screws for sandwich panels

Self-drilling screws ESPS-20S-P 6,3/5,5xL with hexagon head, washer A19, A22, A25 or A29 and linear washer ELW-Z or ELW-S

Annex 93

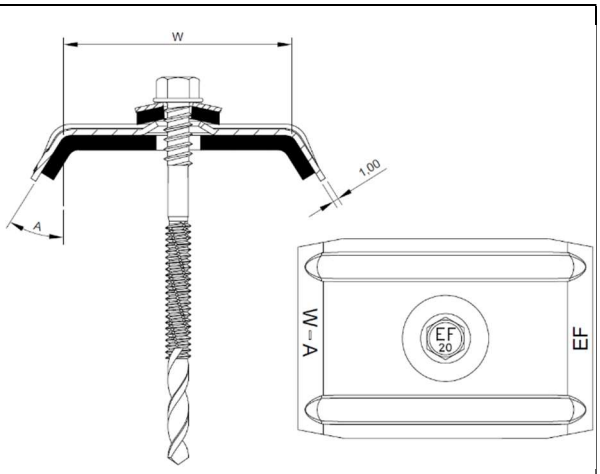
of European Technical Assessment ETA-16/0734

Materials

Fastener:	carbon steel – SAE1022, quenched, tempered and coated: galvanized with PREMIUM coating
Washer:	A19, A22, A25, A29 – aluminum washer with EPDM ring
Saddle washer:	ESW made of aluminum
Component I:	S280GD, S320GD or S350GD – EN 10346
Component II:	S235 to S355 – EN 10025-1 S280GD, S320GD or S350GD – EN 10346

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

Timber substructures
no performance assessed



$t_{N,II}$ [mm]		4.00	5.00	6.00	8.00	10.00	12.00	16.00	19.00
$V_{R,k}$ [kN] for $t_{N,I}$ [mm]	0.40	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84
	0.50	1.72	1.72	1.72	1.72	1.72	1.72	1.72	1.72
	0.55	1.72	1.72	1.72	1.72	1.72	1.72	1.72	1.72
	0.60	1.72	1.72	1.72	1.72	1.72	1.72	1.72	1.72
	0.63	1.90	1.90	1.90	1.90	1.90	1.90	1.90	1.90
	0.70	1.99	1.99	1.99	1.99	1.99	1.99	1.99	1.99
	0.75	2.69	2.69	2.69	2.69	2.69	2.69	2.69	2.69
	0.88	2.69	2.69	2.69	2.69	2.69	2.69	2.69	2.69
	1.00	3.10	3.10	3.10	3.10	3.10	3.10	3.10	3.10
$N_{R,k}$ [kN] for $t_{N,I}$ [mm]	0.40	8.02	8.02	10.14	10.14	10.14	10.14	10.14	10.14
	0.50	8.02	8.02	10.90	10.90	10.90	10.90	10.90	10.90
	0.55	8.02	8.02	10.90	10.90	10.90	10.90	10.90	10.90
	0.60	8.02	8.02	10.90	10.90	10.90	10.90	10.90	10.90
	0.63	8.02	8.02	10.90	10.90	10.90	10.90	10.90	10.90
	0.70	8.02	8.02	10.90	10.90	10.90	10.90	10.90	10.90
	0.75	8.02	8.02	10.90	10.90	10.90	10.90	10.90	10.90
	0.88	8.02	8.02	10.90	10.90	10.90	10.90	10.90	10.90
	1.00	8.02	8.02	10.90	10.90	10.90	10.90	10.90	10.90
$N_{R\,II,k}$ [kN]		8.02	8.02	12.65	12.65	12.65	12.65	12.65	12.65
max. head displacement "u" depending on sandwich panel thickness [mm]	30	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7
	40	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9
	50	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2
	60	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4
	70	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6
	80	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8
	90	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1
	100	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3
	110	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5
	120	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8
	130	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
	≥140	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2

Fastening screws for sandwich panels

Self-drilling screws ESPS-20S-P 6,3/5,5xL with hexagon head, washer A19, A22, A25 or A29 and saddle washer ESW

Annex 94

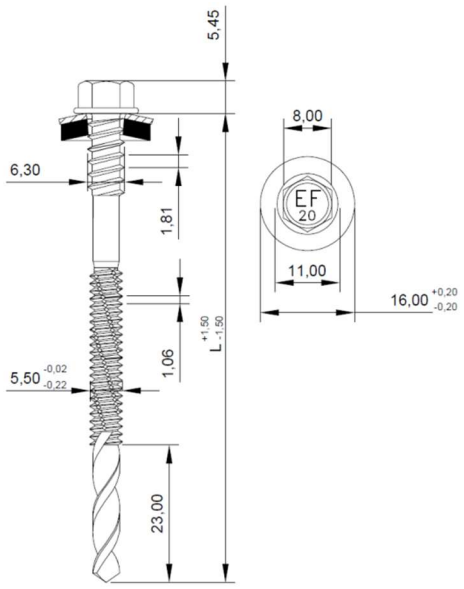
of European Technical Assessment ETA-16/0734

Materials

Fastener:	carbon steel – SAE1022, quenched, tempered and coated: galvanized with PREMIUM coating
Washer:	A16 – aluminum washer with EPDM ring
Component I:	S280GD, S320GD or S350GD – EN 10346
Component II:	S235 to S355 – EN 10025-1 S280GD, S320GD or S350GD – EN 10346

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

Timber substructures
no performance assessed



$t_{N,II}$ [mm]		4.00	5.00	6.00	8.00	10.00	12.00	16.00	19.00
$V_{R,k}$ [kN] for $t_{N,I}$ [mm]	0.40	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84
	0.50	1.72	1.72	1.72	1.72	1.72	1.72	1.72	1.72
	0.55	1.72	1.72	1.72	1.72	1.72	1.72	1.72	1.72
	0.60	1.72	1.72	1.72	1.72	1.72	1.72	1.72	1.72
	0.63	1.90	1.90	1.90	1.90	1.90	1.90	1.90	1.90
	0.70	1.99	1.99	1.99	1.99	1.99	1.99	1.99	1.99
	0.75	2.69	2.69	2.69	2.69	2.69	2.69	2.69	2.69
	0.88	2.69	2.69	2.69	2.69	2.69	2.69	2.69	2.69
	1.00	3.10	3.10	3.10	3.10	3.10	3.10	3.10	3.10
$N_{R,k}$ [kN] for $t_{N,I}$ [mm]	0.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40
	0.50	2.53	2.53	2.53	2.53	2.53	2.53	2.53	2.53
	0.55	2.53	2.53	2.53	2.53	2.53	2.53	2.53	2.53
	0.60	2.77	2.77	2.77	2.77	2.77	2.77	2.77	2.77
	0.63	2.77	2.77	2.77	2.77	2.77	2.77	2.77	2.77
	0.70	2.89	2.89	2.89	2.89	2.89	2.89	2.89	2.89
	0.75	2.89	2.89	2.89	2.89	2.89	2.89	2.89	2.89
	0.88	2.89	2.89	2.89	2.89	2.89	2.89	2.89	2.89
	1.00	4.27	4.27	4.27	4.27	4.27	4.27	4.27	4.27
$N_{R\,II,k}$ [kN]		8.02	8.02	12.65	12.65	12.65	12.65	12.65	12.65
max. head displacement "u" depending on sandwich panel thickness [mm]	30	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7
	40	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9
	50	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2
	60	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4
	70	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6
	80	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8
	90	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1
	100	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3
	110	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5
	120	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8
	130	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
	≥140	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2

Fastening screws for sandwich panels

Self-drilling screws ESPS-20S-P 6,3/5,5xL with hexagon head and washer A16

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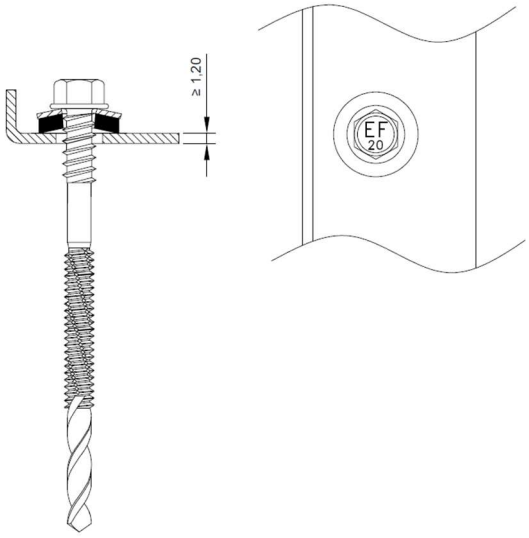
of European Technical Assessment ETA-16/0734

Materials

Fastener:	carbon steel – SAE1022, quenched, tempered and coated: galvanized with PREMIUM coating
Washer:	A16 – aluminum washer with EPDM ring
Linear washer:	ELW-Z made of carbon steel – $R_{0,2} \geq 200$ MPa and galvanized min. 200 g/m^2 ELW-S made of stainless steel A2 – EN ISO 3506
Component I:	S280GD, S320GD or S350GD – EN 10346
Component II:	S235 to S355 – EN 10025-1 S280GD, S320GD or S350GD – EN 10346

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

Timber substructures
no performance assessed



$t_{N,II}$ [mm]		4.00	5.00	6.00	8.00	10.00	12.00	16.00	19.00
$V_{R,k}$ [kN] for $t_{N,I}$ [mm]	0.40	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84
	0.50	1.72	1.72	1.72	1.72	1.72	1.72	1.72	1.72
	0.55	1.72	1.72	1.72	1.72	1.72	1.72	1.72	1.72
	0.60	1.72	1.72	1.72	1.72	1.72	1.72	1.72	1.72
	0.63	1.90	1.90	1.90	1.90	1.90	1.90	1.90	1.90
	0.70	1.99	1.99	1.99	1.99	1.99	1.99	1.99	1.99
	0.75	2.69	2.69	2.69	2.69	2.69	2.69	2.69	2.69
	0.88	2.69	2.69	2.69	2.69	2.69	2.69	2.69	2.69
	1.00	3.10	3.10	3.10	3.10	3.10	3.10	3.10	3.10
$N_{R,k}$ [kN] for $t_{N,I}$ [mm]	0.40	8.02	8.02	12.02	12.02	12.02	12.02	12.02	12.02
	0.50	8.02	8.02	12.02	12.02	12.02	12.02	12.02	12.02
	0.55	8.02	8.02	12.02	12.02	12.02	12.02	12.02	12.02
	0.60	8.02	8.02	12.02	12.02	12.02	12.02	12.02	12.02
	0.63	8.02	8.02	12.02	12.02	12.02	12.02	12.02	12.02
	0.70	8.02	8.02	12.02	12.02	12.02	12.02	12.02	12.02
	0.75	8.02	8.02	12.02	12.02	12.02	12.02	12.02	12.02
	0.88	8.02	8.02	12.02	12.02	12.02	12.02	12.02	12.02
	1.00	8.02	8.02	12.02	12.02	12.02	12.02	12.02	12.02
$N_{R\,II,k}$ [kN]		8.02	8.02	12.65	12.65	12.65	12.65	12.65	12.65
max. head displacement "u" depending on sandwich panel thickness [mm]	30	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7
	40	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9
	50	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2
	60	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4
	70	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6
	80	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8
	90	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1
	100	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3
	110	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5
	120	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8
	130	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
	≥140	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2

Fastening screws for sandwich panels

Self-drilling screws ESPS-20S-P 6,3/5,5xL with hexagon head, washer A16 and linear washer ELW-Z or ELW-S

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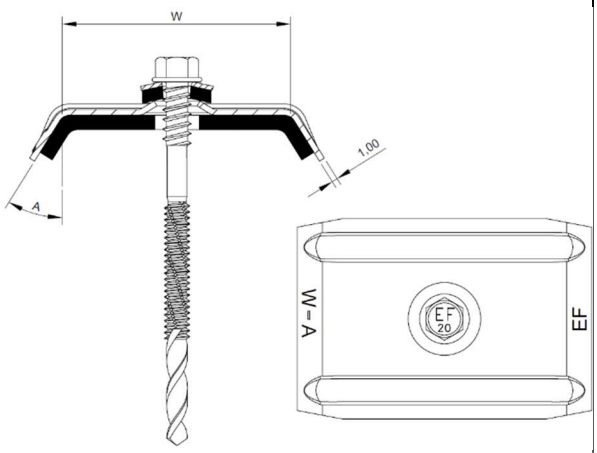
of European Technical Assessment ETA-16/0734

Materials

Fastener:	carbon steel – SAE1022, quenched, tempered and coated: galvanized with PREMIUM coating
Washer:	A16 – aluminum washer with EPDM ring
Saddle washer:	ESW made of aluminum
Component I:	S280GD, S320GD or S350GD – EN 10346
Component II:	S235 to S355 – EN 10025-1 S280GD, S320GD or S350GD – EN 10346

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

Timber substructures
no performance assessed



$t_{N,II}$ [mm]		4.00	5.00	6.00	8.00	10.00	12.00	16.00	19.00
$V_{R,k}$ [kN] for $t_{N,I}$ [mm]	0.40	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84
	0.50	1.72	1.72	1.72	1.72	1.72	1.72	1.72	1.72
	0.55	1.72	1.72	1.72	1.72	1.72	1.72	1.72	1.72
	0.60	1.72	1.72	1.72	1.72	1.72	1.72	1.72	1.72
	0.63	1.90	1.90	1.90	1.90	1.90	1.90	1.90	1.90
	0.70	1.99	1.99	1.99	1.99	1.99	1.99	1.99	1.99
	0.75	2.69	2.69	2.69	2.69	2.69	2.69	2.69	2.69
	0.88	2.69	2.69	2.69	2.69	2.69	2.69	2.69	2.69
	1.00	3.10	3.10	3.10	3.10	3.10	3.10	3.10	3.10
$N_{R,k}$ [kN] for $t_{N,I}$ [mm]	0.40	8.02	8.02	10.53	10.53	10.53	10.53	10.53	10.53
	0.50	8.02	8.02	10.92	10.92	10.92	10.92	10.92	10.92
	0.55	8.02	8.02	10.92	10.92	10.92	10.92	10.92	10.92
	0.60	8.02	8.02	10.92	10.92	10.92	10.92	10.92	10.92
	0.63	8.02	8.02	10.92	10.92	10.92	10.92	10.92	10.92
	0.70	8.02	8.02	10.92	10.92	10.92	10.92	10.92	10.92
	0.75	8.02	8.02	10.92	10.92	10.92	10.92	10.92	10.92
	0.88	8.02	8.02	10.92	10.92	10.92	10.92	10.92	10.92
	1.00	8.02	8.02	10.92	10.92	10.92	10.92	10.92	10.92
$N_{R\ II,k}$ [kN]		8.02	8.02	12.65	12.65	12.65	12.65	12.65	12.65
max. head displacement "u" depending on sandwich panel thickness [mm]	30	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7
	40	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9
	50	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2
	60	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4
	70	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6
	80	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8
	90	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1
	100	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3
	110	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5
	120	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8
	130	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
	≥140	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2

Fastening screws for sandwich panels

Self-drilling screws ESPS-20S-P 6,3/5,5xL with hexagon head, washer A16 and saddle washer ESW

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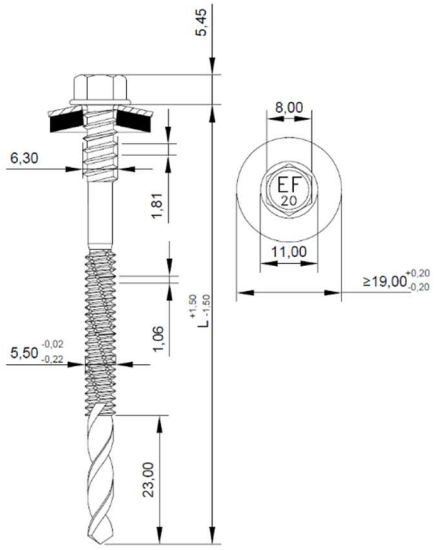
of European Technical Assessment ETA-16/0734

Materials

Fastener:	carbon steel – SAE1022, quenched, tempered and coated: galvanized with SUPER PREMIUM coating
Washer:	S19, S22, S25, S29 – stainless steel washer with EPDM ring or A19, A22, A25, A29 – aluminum washer with EPDM ring
Component I:	S280GD, S320GD or S350GD – EN 10346
Component II:	S235 to S355 – EN 10025-1 S280GD, S320GD or S350GD – EN 10346

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

Timber substructures
no performance assessed



$t_{N,II}$ [mm]		4.00	5.00	6.00	8.00	10.00	12.00	16.00	19.00
$V_{R,k}$ [kN] for $t_{N,I}$ [mm]	0.40	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84
	0.50	1.72	1.72	1.72	1.72	1.72	1.72	1.72	1.72
	0.55	1.72	1.72	1.72	1.72	1.72	1.72	1.72	1.72
	0.60	1.72	1.72	1.72	1.72	1.72	1.72	1.72	1.72
	0.63	1.90	1.90	1.90	1.90	1.90	1.90	1.90	1.90
	0.70	1.99	1.99	1.99	1.99	1.99	1.99	1.99	1.99
	0.75	2.69	2.69	2.69	2.69	2.69	2.69	2.69	2.69
	0.88	2.69	2.69	2.69	2.69	2.69	2.69	2.69	2.69
	1.00	3.10	3.10	3.10	3.10	3.10	3.10	3.10	3.10
$N_{R,k}$ [kN] for $t_{N,I}$ [mm]	0.40	1.81	1.81	1.81	1.81	1.81	1.81	1.81	1.81
	0.50	4.14	4.14	4.14	4.14	4.14	4.14	4.14	4.14
	0.55	4.14	4.14	4.14	4.14	4.14	4.14	4.14	4.14
	0.60	4.14	4.14	4.14	4.14	4.14	4.14	4.14	4.14
	0.63	5.10	5.10	5.10	5.10	5.10	5.10	5.10	5.10
	0.70	5.50	5.50	5.50	5.50	5.50	5.50	5.50	5.50
	0.75	7.70	7.70	7.70	7.70	7.70	7.70	7.70	7.70
	0.88	7.70	7.70	7.70	7.70	7.70	7.70	7.70	7.70
	1.00	7.78	7.78	7.78	7.78	7.78	7.78	7.78	7.78
$N_{R\ II,k}$ [kN]		8.02	8.02	12.65	12.65	12.65	12.65	12.65	12.65
max. head displacement "u" depending on sandwich panel thickness [mm]	30	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7
	40	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9
	50	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2
	60	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4
	70	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6
	80	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8
	90	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1
	100	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3
	110	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5
	120	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8
	130	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
	≥140	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2

Fastening screws for sandwich panels

Self-drilling screws ESPS-20S-SP 6,3/5,5xL with hexagon head and washer S19, S22, S25, S29, A19, A22, A25 or A29

Annex 98

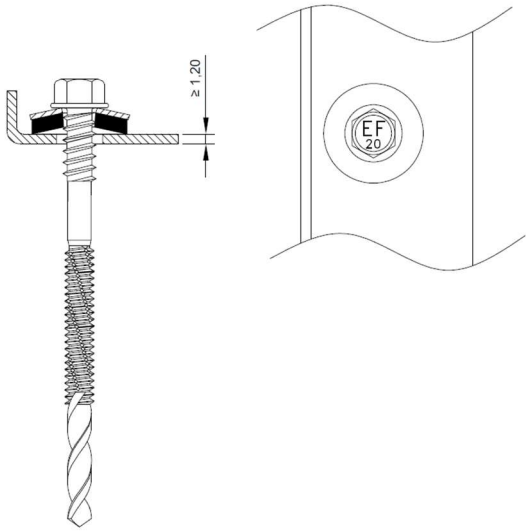
of European Technical Assessment ETA-16/0734

Materials

Fastener:	carbon steel – SAE1022, quenched, tempered and coated: galvanized with SUPER PREMIUM coating
Washer:	S19, S22, S25, S29 – stainless steel washer with EPDM ring or A19, A22, A25, A29 – aluminum washer with EPDM ring
Linear washer:	ELW-Z made of carbon steel – $R_{0,2} \geq 200$ MPa and galvanized min. 200 g/m^2 ELW-S made of stainless steel A2 – EN ISO 3506
Component I:	S280GD, S320GD or S350GD – EN 10346
Component II:	S235 to S355 – EN 10025-1 S280GD, S320GD or S350GD – EN 10346

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

Timber substructures
no performance assessed



$t_{N,II}$ [mm]		4.00	5.00	6.00	8.00	10.00	12.00	16.00	19.00
$V_{R,k}$ [kN] for $t_{N,I}$ [mm]	0.40	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84
	0.50	1.72	1.72	1.72	1.72	1.72	1.72	1.72	1.72
	0.55	1.72	1.72	1.72	1.72	1.72	1.72	1.72	1.72
	0.60	1.72	1.72	1.72	1.72	1.72	1.72	1.72	1.72
	0.63	1.90	1.90	1.90	1.90	1.90	1.90	1.90	1.90
	0.70	1.99	1.99	1.99	1.99	1.99	1.99	1.99	1.99
	0.75	2.69	2.69	2.69	2.69	2.69	2.69	2.69	2.69
	0.88	2.69	2.69	2.69	2.69	2.69	2.69	2.69	2.69
	1.00	3.10	3.10	3.10	3.10	3.10	3.10	3.10	3.10
$N_{R,k}$ [kN] for $t_{N,I}$ [mm]	0.40	7.78	7.78	7.78	7.78	7.78	7.78	7.78	7.78
	0.50	7.78	7.78	7.78	7.78	7.78	7.78	7.78	7.78
	0.55	7.78	7.78	7.78	7.78	7.78	7.78	7.78	7.78
	0.60	7.78	7.78	7.78	7.78	7.78	7.78	7.78	7.78
	0.63	7.78	7.78	7.78	7.78	7.78	7.78	7.78	7.78
	0.70	7.78	7.78	7.78	7.78	7.78	7.78	7.78	7.78
	0.75	7.78	7.78	7.78	7.78	7.78	7.78	7.78	7.78
	0.88	7.78	7.78	7.78	7.78	7.78	7.78	7.78	7.78
	1.00	7.78	7.78	7.78	7.78	7.78	7.78	7.78	7.78
$N_{R\ II,k}$ [kN]		8.02	8.02	12.65	12.65	12.65	12.65	12.65	12.65
max. head displacement "u" depending on sandwich panel thickness [mm]	30	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7
	40	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9
	50	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2
	60	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4
	70	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6
	80	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8
	90	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1
	100	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3
	110	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5
	120	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8
	130	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
	≥140	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2

Fastening screws for sandwich panels

Self-drilling screws ESPS-20S-SP 6,3/5,5xL with hexagon head, washer S19, S22, S25, S29, A19, A22, A25 or A29 and linear washer ELW-Z or ELW-S

Annex 99

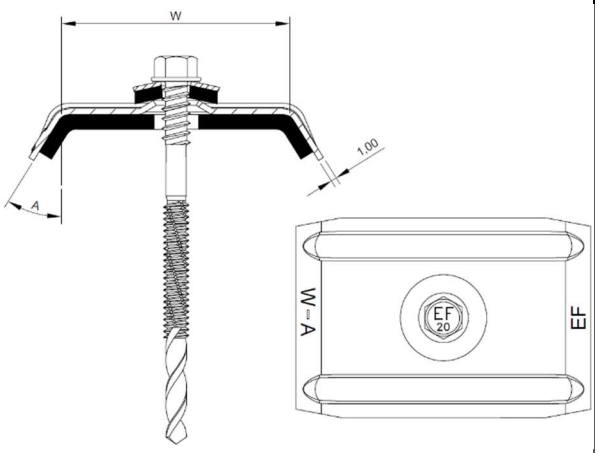
of European Technical Assessment ETA-16/0734

Materials

Fastener:	carbon steel – SAE1022, quenched, tempered and coated: galvanized with SUPER PREMIUM coating
Washer:	S19, S22, S25, S29 – stainless steel washer with EPDM ring or A19, A22, A25, A29 – aluminum washer with EPDM ring
Saddle washer:	ESW made of aluminum
Component I:	S280GD, S320GD or S350GD – EN 10346
Component II:	S235 to S355 – EN 10025-1 S280GD, S320GD or S350GD – EN 10346

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

Timber substructures
no performance assessed



$t_{N,II}$ [mm]		4.00	5.00	6.00	8.00	10.00	12.00	16.00	19.00
$V_{R,k}$ [kN] for $t_{N,I}$ [mm]	0.40	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84
	0.50	1.72	1.72	1.72	1.72	1.72	1.72	1.72	1.72
	0.55	1.72	1.72	1.72	1.72	1.72	1.72	1.72	1.72
	0.60	1.72	1.72	1.72	1.72	1.72	1.72	1.72	1.72
	0.63	1.90	1.90	1.90	1.90	1.90	1.90	1.90	1.90
	0.70	1.99	1.99	1.99	1.99	1.99	1.99	1.99	1.99
	0.75	2.69	2.69	2.69	2.69	2.69	2.69	2.69	2.69
	0.88	2.69	2.69	2.69	2.69	2.69	2.69	2.69	2.69
	1.00	3.10	3.10	3.10	3.10	3.10	3.10	3.10	3.10
$N_{R,k}$ [kN] for $t_{N,I}$ [mm]	0.40	8.02	8.02	10.14	10.14	10.14	10.14	10.14	10.14
	0.50	8.02	8.02	10.90	10.90	10.90	10.90	10.90	10.90
	0.55	8.02	8.02	10.90	10.90	10.90	10.90	10.90	10.90
	0.60	8.02	8.02	10.90	10.90	10.90	10.90	10.90	10.90
	0.63	8.02	8.02	10.90	10.90	10.90	10.90	10.90	10.90
	0.70	8.02	8.02	10.90	10.90	10.90	10.90	10.90	10.90
	0.75	8.02	8.02	10.90	10.90	10.90	10.90	10.90	10.90
	0.88	8.02	8.02	10.90	10.90	10.90	10.90	10.90	10.90
	1.00	8.02	8.02	10.90	10.90	10.90	10.90	10.90	10.90
$N_{R\ II,k}$ [kN]		8.02	8.02	12.65	12.65	12.65	12.65	12.65	12.65
max. head displacement "u" depending on sandwich panel thickness [mm]	30	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7
	40	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9
	50	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2
	60	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4
	70	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6
	80	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8
	90	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1
	100	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3
	110	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5
	120	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8
	130	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
	≥140	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2

Fastening screws for sandwich panels

Self-drilling screws ESPS-20S-SP 6,3/5,5xL with hexagon head, washer S19, S22, S25, S29, A19, A22, A25 or A29 and saddle washer ESW

Annex 100

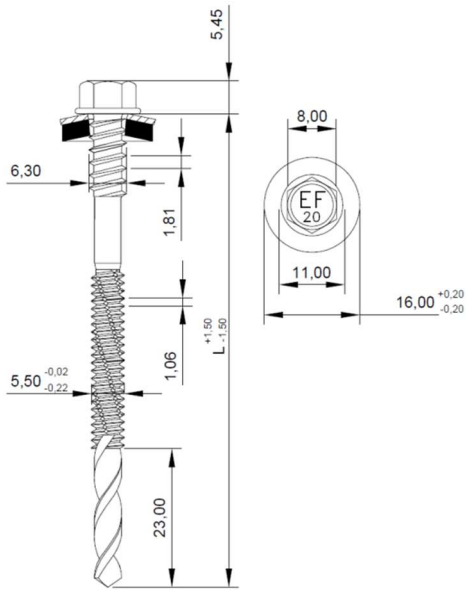
of European Technical Assessment ETA-16/0734

Materials

Fastener:	carbon steel – SAE1022, quenched, tempered and coated: galvanized with SUPER PREMIUM coating
Washer:	S16 – stainless steel washer with EPDM ring or A16 – aluminum washer with EPDM ring
Component I:	S280GD, S320GD or S350GD – EN 10346
Component II:	S235 to S355 – EN 10025-1 S280GD, S320GD or S350GD – EN 10346

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

Timber substructures
no performance assessed



$t_{N,II}$ [mm]		4.00	5.00	6.00	8.00	10.00	12.00	16.00	19.00
$V_{R,k}$ [kN] for $t_{N,I}$ [mm]	0.40	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84
	0.50	1.72	1.72	1.72	1.72	1.72	1.72	1.72	1.72
	0.55	1.72	1.72	1.72	1.72	1.72	1.72	1.72	1.72
	0.60	1.72	1.72	1.72	1.72	1.72	1.72	1.72	1.72
	0.63	1.90	1.90	1.90	1.90	1.90	1.90	1.90	1.90
	0.70	1.99	1.99	1.99	1.99	1.99	1.99	1.99	1.99
	0.75	2.69	2.69	2.69	2.69	2.69	2.69	2.69	2.69
	0.88	2.69	2.69	2.69	2.69	2.69	2.69	2.69	2.69
	1.00	3.10	3.10	3.10	3.10	3.10	3.10	3.10	3.10
$N_{R,k}$ [kN] for $t_{N,I}$ [mm]	0.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40
	0.50	2.53	2.53	2.53	2.53	2.53	2.53	2.53	2.53
	0.55	2.53	2.53	2.53	2.53	2.53	2.53	2.53	2.53
	0.60	2.77	2.77	2.77	2.77	2.77	2.77	2.77	2.77
	0.63	2.77	2.77	2.77	2.77	2.77	2.77	2.77	2.77
	0.70	2.89	2.89	2.89	2.89	2.89	2.89	2.89	2.89
	0.75	2.89	2.89	2.89	2.89	2.89	2.89	2.89	2.89
	0.88	2.89	2.89	2.89	2.89	2.89	2.89	2.89	2.89
	1.00	4.27	4.27	4.27	4.27	4.27	4.27	4.27	4.27
$N_{R\ II,k}$ [kN]		8.02	8.02	12.65	12.65	12.65	12.65	12.65	12.65
max. head displacement "u" depending on sandwich panel thickness [mm]	30	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7
	40	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9
	50	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2
	60	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4
	70	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6
	80	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8
	90	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1
	100	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3
	110	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5
	120	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8
	130	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
	≥140	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2

Fastening screws for sandwich panels

Self-drilling screws ESPS-20S-SP 6,3/5,5xL with hexagon head and washer S16 or A16

Annex 101

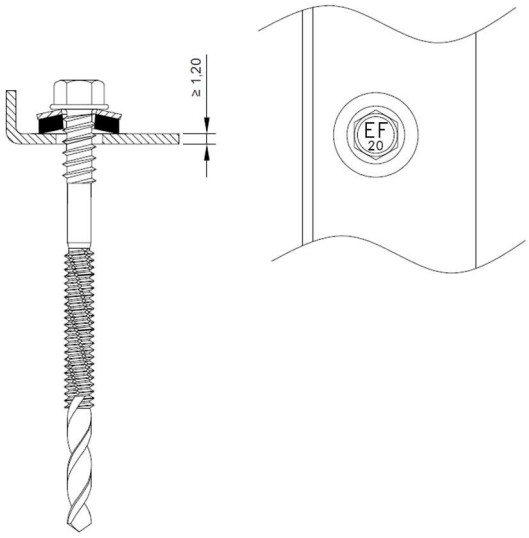
of European Technical Assessment ETA-16/0734

Materials

Fastener:	carbon steel – SAE1022, quenched, tempered and coated: galvanized with SUPER PREMIUM coating
Washer:	S16 – stainless steel washer with EPDM ring or A16 – aluminum washer with EPDM ring
Linear washer:	ELW-Z made of carbon steel – $R_{0,2} \geq 200$ MPa and galvanized min. 200 g/m^2 ELW-S made of stainless steel A2 – EN ISO 3506
Component I:	S280GD, S320GD or S350GD – EN 10346
Component II:	S235 to S355 – EN 10025-1 S280GD, S320GD or S350GD – EN 10346

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

Timber substructures
no performance assessed



$t_{N,II}$ [mm]		4.00	5.00	6.00	8.00	10.00	12.00	16.00	19.00
$V_{R,k}$ [kN] for $t_{N,I}$ [mm]	0.40	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84
	0.50	1.72	1.72	1.72	1.72	1.72	1.72	1.72	1.72
	0.55	1.72	1.72	1.72	1.72	1.72	1.72	1.72	1.72
	0.60	1.72	1.72	1.72	1.72	1.72	1.72	1.72	1.72
	0.63	1.90	1.90	1.90	1.90	1.90	1.90	1.90	1.90
	0.70	1.99	1.99	1.99	1.99	1.99	1.99	1.99	1.99
	0.75	2.69	2.69	2.69	2.69	2.69	2.69	2.69	2.69
	0.88	2.69	2.69	2.69	2.69	2.69	2.69	2.69	2.69
	1.00	3.10	3.10	3.10	3.10	3.10	3.10	3.10	3.10
$N_{R,k}$ [kN] for $t_{N,I}$ [mm]	0.40	8.02	8.02	12.02	12.02	12.02	12.02	12.02	12.02
	0.50	8.02	8.02	12.02	12.02	12.02	12.02	12.02	12.02
	0.55	8.02	8.02	12.02	12.02	12.02	12.02	12.02	12.02
	0.60	8.02	8.02	12.02	12.02	12.02	12.02	12.02	12.02
	0.63	8.02	8.02	12.02	12.02	12.02	12.02	12.02	12.02
	0.70	8.02	8.02	12.02	12.02	12.02	12.02	12.02	12.02
	0.75	8.02	8.02	12.02	12.02	12.02	12.02	12.02	12.02
	0.88	8.02	8.02	12.02	12.02	12.02	12.02	12.02	12.02
	1.00	8.02	8.02	12.02	12.02	12.02	12.02	12.02	12.02
$N_{R\ II,k}$ [kN]		8.02	8.02	12.65	12.65	12.65	12.65	12.65	12.65
max. head displacement "u" depending on sandwich panel thickness [mm]	30	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7
	40	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9
	50	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2
	60	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4
	70	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6
	80	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8
	90	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1
	100	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3
	110	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5
	120	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8
	130	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
	≥140	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2

Fastening screws for sandwich panels

Self-drilling screws ESPS-20S-SP 6,3/5,5xL with hexagon head, washer S16 or A16 and linear washer ELW-Z or ELW-S

Annex 102

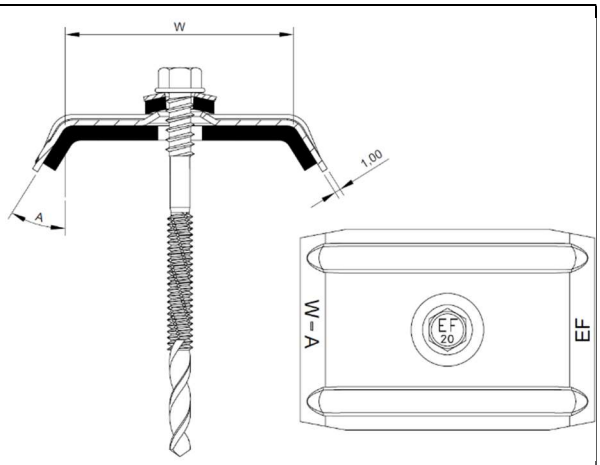
of European Technical Assessment ETA-16/0734

Materials

Fastener:	carbon steel – SAE1022, quenched, tempered and coated: galvanized with SUPER PREMIUM coating
Washer:	S16 – stainless steel washer with EPDM ring or A16 – aluminum washer with EPDM ring
Saddle washer:	ESW made of aluminum
Component I:	S280GD, S320GD or S350GD – EN 10346
Component II:	S235 to S355 – EN 10025-1 S280GD, S320GD or S350GD – EN 10346

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

Timber substructures
no performance assessed



$t_{N,II}$ [mm]		4.00	5.00	6.00	8.00	10.00	12.00	16.00	19.00
$V_{R,k}$ [kN] for $t_{N,I}$ [mm]	0.40	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84
	0.50	1.72	1.72	1.72	1.72	1.72	1.72	1.72	1.72
	0.55	1.72	1.72	1.72	1.72	1.72	1.72	1.72	1.72
	0.60	1.72	1.72	1.72	1.72	1.72	1.72	1.72	1.72
	0.63	1.90	1.90	1.90	1.90	1.90	1.90	1.90	1.90
	0.70	1.99	1.99	1.99	1.99	1.99	1.99	1.99	1.99
	0.75	2.69	2.69	2.69	2.69	2.69	2.69	2.69	2.69
	0.88	2.69	2.69	2.69	2.69	2.69	2.69	2.69	2.69
	1.00	3.10	3.10	3.10	3.10	3.10	3.10	3.10	3.10
$N_{R,k}$ [kN] for $t_{N,I}$ [mm]	0.40	8.02	8.02	10.53	10.53	10.53	10.53	10.53	10.53
	0.50	8.02	8.02	10.92	10.92	10.92	10.92	10.92	10.92
	0.55	8.02	8.02	10.92	10.92	10.92	10.92	10.92	10.92
	0.60	8.02	8.02	10.92	10.92	10.92	10.92	10.92	10.92
	0.63	8.02	8.02	10.92	10.92	10.92	10.92	10.92	10.92
	0.70	8.02	8.02	10.92	10.92	10.92	10.92	10.92	10.92
	0.75	8.02	8.02	10.92	10.92	10.92	10.92	10.92	10.92
	0.88	8.02	8.02	10.92	10.92	10.92	10.92	10.92	10.92
	1.00	8.02	8.02	10.92	10.92	10.92	10.92	10.92	10.92
$N_{R\,II,k}$ [kN]		8.02	8.02	12.65	12.65	12.65	12.65	12.65	12.65
max. head displacement "u" depending on sandwich panel thickness [mm]	30	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7
	40	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9
	50	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2
	60	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4
	70	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6
	80	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8
	90	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1
	100	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3
	110	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5
	120	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8
	130	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
	≥140	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2

Fastening screws for sandwich panels

Self-drilling screws ESPS-20S-SP 6,3/5,5xL with hexagon head, washer S16 or A16 and saddle washer ESW

Annex 103

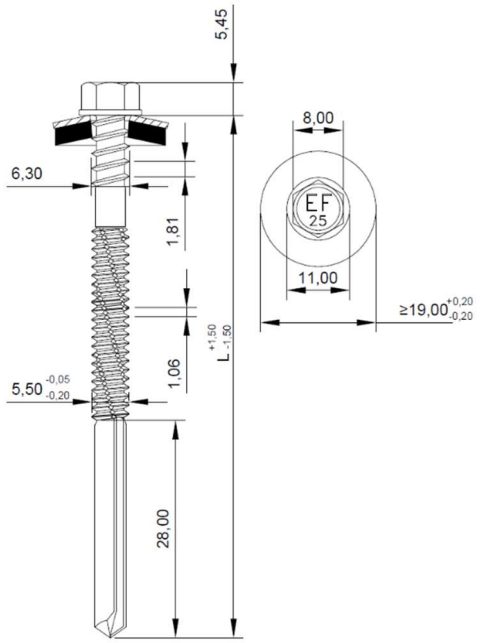
of European Technical Assessment ETA-16/0734

Materials

Fastener:	carbon steel – SAE1022, quenched, tempered and coated: galvanized (12 µm)
Washer:	Z19, Z22, Z25, Z29 – carbon steel washer with EPDM ring
Component I:	S280GD, S320GD or S350GD – EN 10346
Component II:	S235 to S355 – EN 10025-1 S280GD, S320GD or S350GD – EN 10346

Drilling capacity: $\Sigma(t_{N2} + t_{II}) \leq 25$ mm

Timber substructures
no performance assessed



$t_{N,II}$ [mm]		4.00	5.00	6.00	8.00	10.00	12.00	15.00	20.00	24.00
$V_{R,k}$ [kN] for $t_{N,I}$ [mm]	0.40	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84
	0.50	1.72	1.72	1.72	1.72	1.72	1.72	1.72	1.72	1.72
	0.55	1.72	1.72	1.72	1.72	1.72	1.72	1.72	1.72	1.72
	0.60	1.72	1.72	1.72	1.72	1.72	1.72	1.72	1.72	1.72
	0.63	1.90	1.90	1.90	1.90	1.90	1.90	1.90	1.90	1.90
	0.70	1.99	1.99	1.99	1.99	1.99	1.99	1.99	1.99	1.99
	0.75	2.69	2.69	2.69	2.69	2.69	2.69	2.69	2.69	2.69
	0.88	2.69	2.69	2.69	2.69	2.69	2.69	2.69	2.69	2.69
	1.00	3.10	3.10	3.10	3.10	3.10	3.10	3.10	3.10	3.10
$N_{R,k}$ [kN] for $t_{N,I}$ [mm]	0.40	1.81	1.81	1.81	1.81	1.81	1.81	1.81	1.81	1.81
	0.50	4.14	4.14	4.14	4.14	4.14	4.14	4.14	4.14	4.14
	0.55	4.14	4.14	4.14	4.14	4.14	4.14	4.14	4.14	4.14
	0.60	4.14	4.14	4.14	4.14	4.14	4.14	4.14	4.14	4.14
	0.63	5.10	5.10	5.10	5.10	5.10	5.10	5.10	5.10	5.10
	0.70	5.50	5.50	5.50	5.50	5.50	5.50	5.50	5.50	5.50
	0.75	7.70	7.70	7.70	7.70	7.70	7.70	7.70	7.70	7.70
	0.88	7.70	7.70	7.70	7.70	7.70	7.70	7.70	7.70	7.70
	1.00	7.78	7.78	7.78	7.78	7.78	7.78	7.78	7.78	7.78
$N_{R\,II,k}$ [kN]		8.02	8.02	12.65	12.65	12.65	12.65	12.65	12.65	12.65
max. head displacement "u" depending on sandwich panel thickness [mm]	30	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7
	40	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9
	50	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2
	60	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4
	70	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6
	80	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8
	90	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1
	100	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3
	110	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5
	120	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8
	130	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
	≥140	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2

Fastening screws for sandwich panels

Self-drilling screws ESPS-25-Z 6,3/5,5xL with hexagon head and washer Z19, Z22, Z25 or Z29

Annex 104

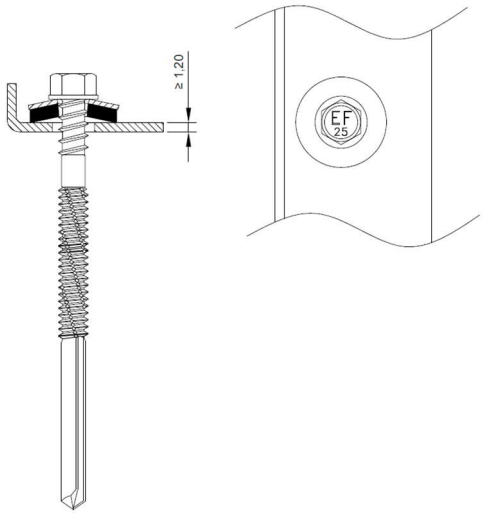
of European Technical Assessment ETA-16/0734

Materials

Fastener:	carbon steel – SAE1022, quenched, tempered and coated: galvanized (12 µm)
Washer:	Z19, Z22, Z25, Z29 – carbon steel washer with EPDM ring
Linear washer:	ELW-Z made of carbon steel – $R_{0,2} \geq 200$ MPa and galvanized min. 200 g/m^2 ELW-S made of stainless steel A2 – EN ISO 3506
Component I:	S280GD, S320GD or S350GD – EN 10346
Component II:	S235 to S355 – EN 10025-1 S280GD, S320GD or S350GD – EN 10346

Drilling capacity: $\Sigma(t_{N2} + t_{II}) \leq 25$ mm

Timber substructures
no performance assessed



$t_{N,II}$ [mm]		4.00	5.00	6.00	8.00	10.00	12.00	15.00	20.00	24.00
$V_{R,k}$ [kN] for $t_{N,I}$ [mm]	0.40	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84
	0.50	1.72	1.72	1.72	1.72	1.72	1.72	1.72	1.72	1.72
	0.55	1.72	1.72	1.72	1.72	1.72	1.72	1.72	1.72	1.72
	0.60	1.72	1.72	1.72	1.72	1.72	1.72	1.72	1.72	1.72
	0.63	1.90	1.90	1.90	1.90	1.90	1.90	1.90	1.90	1.90
	0.70	1.99	1.99	1.99	1.99	1.99	1.99	1.99	1.99	1.99
	0.75	2.69	2.69	2.69	2.69	2.69	2.69	2.69	2.69	2.69
	0.88	2.69	2.69	2.69	2.69	2.69	2.69	2.69	2.69	2.69
	1.00	3.10	3.10	3.10	3.10	3.10	3.10	3.10	3.10	3.10
$N_{R,k}$ [kN] for $t_{N,I}$ [mm]	0.40	7.78	7.78	7.78	7.78	7.78	7.78	7.78	7.78	7.78
	0.50	7.78	7.78	7.78	7.78	7.78	7.78	7.78	7.78	7.78
	0.55	7.78	7.78	7.78	7.78	7.78	7.78	7.78	7.78	7.78
	0.60	7.78	7.78	7.78	7.78	7.78	7.78	7.78	7.78	7.78
	0.63	7.78	7.78	7.78	7.78	7.78	7.78	7.78	7.78	7.78
	0.70	7.78	7.78	7.78	7.78	7.78	7.78	7.78	7.78	7.78
	0.75	7.78	7.78	7.78	7.78	7.78	7.78	7.78	7.78	7.78
	0.88	7.78	7.78	7.78	7.78	7.78	7.78	7.78	7.78	7.78
	1.00	7.78	7.78	7.78	7.78	7.78	7.78	7.78	7.78	7.78
$N_{R\,II,k}$ [kN]		8.02	8.02	12.65	12.65	12.65	12.65	12.65	12.65	12.65
max. head displacement "u" depending on sandwich panel thickness [mm]	30	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7
	40	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9
	50	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2
	60	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4
	70	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6
	80	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8
	90	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1
	100	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3
	110	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5
	120	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8
	130	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
	≥140	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2

Fastening screws for sandwich panels

Self-drilling screws ESPS-25-Z 6,3/5,5xL with hexagon head, washer Z19, Z22, Z25 or Z29 and linear washer ELW-Z or ELW-S

Annex 105

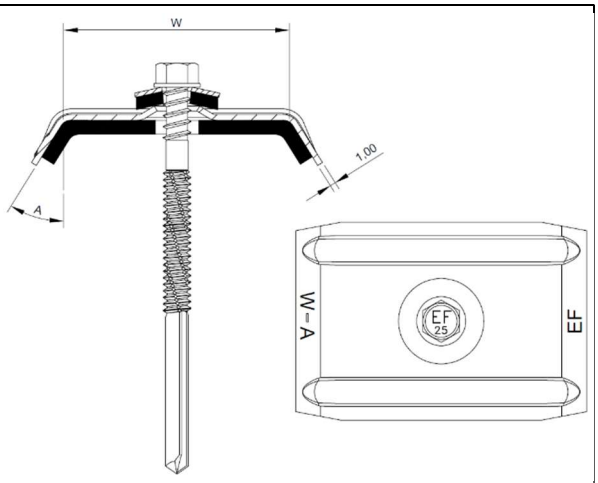
of European Technical Assessment ETA-16/0734

Materials

Fastener:	carbon steel – SAE1022, quenched, tempered and coated: galvanized (12 µm)
Washer:	Z19, Z22, Z25, Z29 – carbon steel washer with EPDM ring
Saddle washer:	ESW made of aluminum
Component I:	S280GD, S320GD or S350GD – EN 10346
Component II:	S235 to S355 – EN 10025-1 S280GD, S320GD or S350GD – EN 10346

Drilling capacity: $\Sigma(t_{N2} + t_{II}) \leq 25$ mm

Timber substructures
no performance assessed



$t_{N,II}$ [mm]		4.00	5.00	6.00	8.00	10.00	12.00	15.00	20.00	24.00
$V_{R,k}$ [kN] for $t_{N,I}$ [mm]	0.40	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84
	0.50	1.72	1.72	1.72	1.72	1.72	1.72	1.72	1.72	1.72
	0.55	1.72	1.72	1.72	1.72	1.72	1.72	1.72	1.72	1.72
	0.60	1.72	1.72	1.72	1.72	1.72	1.72	1.72	1.72	1.72
	0.63	1.90	1.90	1.90	1.90	1.90	1.90	1.90	1.90	1.90
	0.70	1.99	1.99	1.99	1.99	1.99	1.99	1.99	1.99	1.99
	0.75	2.69	2.69	2.69	2.69	2.69	2.69	2.69	2.69	2.69
	0.88	2.69	2.69	2.69	2.69	2.69	2.69	2.69	2.69	2.69
	1.00	3.10	3.10	3.10	3.10	3.10	3.10	3.10	3.10	3.10
$N_{R,k}$ [kN] for $t_{N,I}$ [mm]	0.40	8.02	8.02	10.14	10.14	10.14	10.14	10.14	10.14	10.14
	0.50	8.02	8.02	10.90	10.90	10.90	10.90	10.90	10.90	10.90
	0.55	8.02	8.02	10.90	10.90	10.90	10.90	10.90	10.90	10.90
	0.60	8.02	8.02	10.90	10.90	10.90	10.90	10.90	10.90	10.90
	0.63	8.02	8.02	10.90	10.90	10.90	10.90	10.90	10.90	10.90
	0.70	8.02	8.02	10.90	10.90	10.90	10.90	10.90	10.90	10.90
	0.75	8.02	8.02	10.90	10.90	10.90	10.90	10.90	10.90	10.90
	0.88	8.02	8.02	10.90	10.90	10.90	10.90	10.90	10.90	10.90
	1.00	8.02	8.02	10.90	10.90	10.90	10.90	10.90	10.90	10.90
$N_{R\,II,k}$ [kN]		8.02	8.02	12.65	12.65	12.65	12.65	12.65	12.65	12.65
max. head displacement "u" depending on sandwich panel thickness [mm]	30	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7
	40	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9
	50	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2
	60	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4
	70	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6
	80	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8
	90	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1
	100	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3
	110	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5
	120	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8
	130	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
	≥140	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2

Fastening screws for sandwich panels

Self-drilling screws ESPS-25-Z 6,3/5,5xL with hexagon head, washer Z19, Z22, Z25 or Z29 and saddle washer ESW

Annex 106

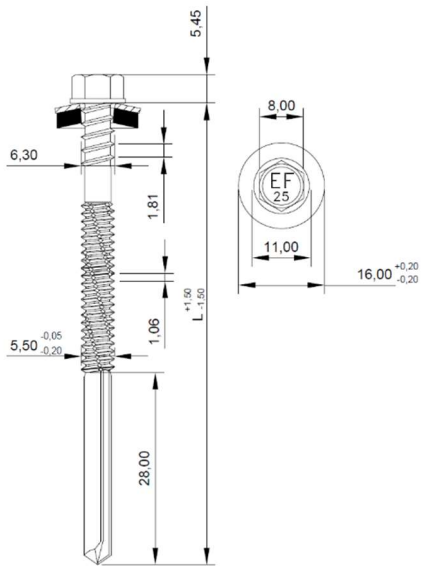
of European Technical Assessment ETA-16/0734

Materials

Fastener:	carbon steel – SAE1022, quenched, tempered and coated: galvanized (12 µm)
Washer:	Z16 – carbon steel washer with EPDM ring
Component I:	S280GD, S320GD or S350GD – EN 10346
Component II:	S235 to S355 – EN 10025-1 S280GD, S320GD or S350GD – EN 10346

Drilling capacity: $\Sigma(t_{N2} + t_{II}) \leq 25$ mm

Timber substructures
no performance assessed



$t_{N,II}$ [mm]		4.00	5.00	6.00	8.00	10.00	12.00	15.00	20.00	24.00
$V_{R,k}$ [kN] for $t_{N,I}$ [mm]	0.40	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84
	0.50	1.72	1.72	1.72	1.72	1.72	1.72	1.72	1.72	1.72
	0.55	1.72	1.72	1.72	1.72	1.72	1.72	1.72	1.72	1.72
	0.60	1.72	1.72	1.72	1.72	1.72	1.72	1.72	1.72	1.72
	0.63	1.90	1.90	1.90	1.90	1.90	1.90	1.90	1.90	1.90
	0.70	1.99	1.99	1.99	1.99	1.99	1.99	1.99	1.99	1.99
	0.75	2.69	2.69	2.69	2.69	2.69	2.69	2.69	2.69	2.69
	0.88	2.69	2.69	2.69	2.69	2.69	2.69	2.69	2.69	2.69
	1.00	3.10	3.10	3.10	3.10	3.10	3.10	3.10	3.10	3.10
$N_{R,k}$ [kN] for $t_{N,I}$ [mm]	0.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40
	0.50	2.53	2.53	2.53	2.53	2.53	2.53	2.53	2.53	2.53
	0.55	2.53	2.53	2.53	2.53	2.53	2.53	2.53	2.53	2.53
	0.60	2.77	2.77	2.77	2.77	2.77	2.77	2.77	2.77	2.77
	0.63	2.77	2.77	2.77	2.77	2.77	2.77	2.77	2.77	2.77
	0.70	2.89	2.89	2.89	2.89	2.89	2.89	2.89	2.89	2.89
	0.75	2.89	2.89	2.89	2.89	2.89	2.89	2.89	2.89	2.89
	0.88	2.89	2.89	2.89	2.89	2.89	2.89	2.89	2.89	2.89
	1.00	4.27	4.27	4.27	4.27	4.27	4.27	4.27	4.27	4.27
$N_{R\,II,k}$ [kN]		8.02	8.02	12.65	12.65	12.65	12.65	12.65	12.65	12.65
max. head displacement "u" depending on sandwich panel thickness [mm]	30	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7
	40	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9
	50	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2
	60	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4
	70	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6
	80	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8
	90	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1
	100	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3
	110	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5
	120	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8
	130	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
	≥140	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2

Fastening screws for sandwich panels

Self-drilling screws ESPS-25-Z 6,3/5,5xL with hexagon head and washer Z16

Annex 107

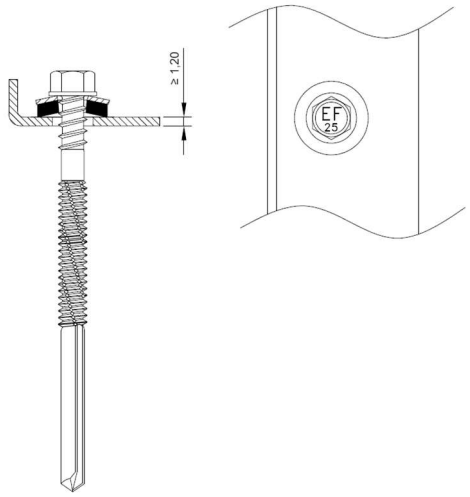
of European Technical Assessment ETA-16/0734

Materials

Fastener:	carbon steel – SAE1022, quenched, tempered and coated: galvanized (12 µm)
Washer:	Z16 – carbon steel washer with EPDM ring
Linear washer:	ELW-Z made of carbon steel – $R_{0,2} \geq 200$ MPa and galvanized min. 200 g/m^2 ELW-S made of stainless steel A2 – EN ISO 3506
Component I:	S280GD, S320GD or S350GD – EN 10346
Component II:	S235 to S355 – EN 10025-1 S280GD, S320GD or S350GD – EN 10346

Drilling capacity: $\Sigma(t_{N2} + t_{II}) \leq 25$ mm

Timber substructures
no performance assessed



$t_{N,II}$ [mm]		4.00	5.00	6.00	8.00	10.00	12.00	15.00	20.00	24.00
$V_{R,k}$ [kN] for $t_{N,I}$ [mm]	0.40	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84
	0.50	1.72	1.72	1.72	1.72	1.72	1.72	1.72	1.72	1.72
	0.55	1.72	1.72	1.72	1.72	1.72	1.72	1.72	1.72	1.72
	0.60	1.72	1.72	1.72	1.72	1.72	1.72	1.72	1.72	1.72
	0.63	1.90	1.90	1.90	1.90	1.90	1.90	1.90	1.90	1.90
	0.70	1.99	1.99	1.99	1.99	1.99	1.99	1.99	1.99	1.99
	0.75	2.69	2.69	2.69	2.69	2.69	2.69	2.69	2.69	2.69
	0.88	2.69	2.69	2.69	2.69	2.69	2.69	2.69	2.69	2.69
	1.00	3.10	3.10	3.10	3.10	3.10	3.10	3.10	3.10	3.10
$N_{R,k}$ [kN] for $t_{N,I}$ [mm]	0.40	8.02	8.02	12.02	12.02	12.02	12.02	12.02	12.02	12.02
	0.50	8.02	8.02	12.02	12.02	12.02	12.02	12.02	12.02	12.02
	0.55	8.02	8.02	12.02	12.02	12.02	12.02	12.02	12.02	12.02
	0.60	8.02	8.02	12.02	12.02	12.02	12.02	12.02	12.02	12.02
	0.63	8.02	8.02	12.02	12.02	12.02	12.02	12.02	12.02	12.02
	0.70	8.02	8.02	12.02	12.02	12.02	12.02	12.02	12.02	12.02
	0.75	8.02	8.02	12.02	12.02	12.02	12.02	12.02	12.02	12.02
	0.88	8.02	8.02	12.02	12.02	12.02	12.02	12.02	12.02	12.02
	1.00	8.02	8.02	12.02	12.02	12.02	12.02	12.02	12.02	12.02
$N_{R\,II,k}$ [kN]		8.02	8.02	12.65	12.65	12.65	12.65	12.65	12.65	12.65
max. head displacement "u" depending on sandwich panel thickness [mm]	30	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7
	40	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9
	50	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2
	60	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4
	70	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6
	80	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8
	90	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1
	100	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3
	110	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5
	120	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8
	130	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
	≥140	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2

Fastening screws for sandwich panels

Self-drilling screws ESPS-25-Z 6,3/5,5xL with hexagon head, washer Z16 and linear washer ELW-Z or ELW-S

Annex 108

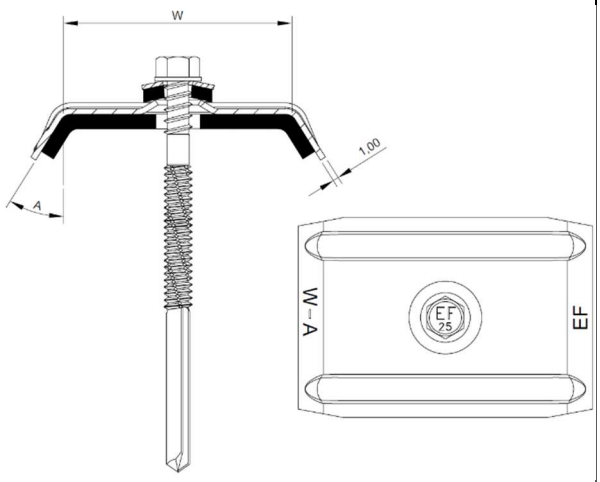
of European Technical Assessment ETA-16/0734

Materials

Fastener:	carbon steel – SAE1022, quenched, tempered and coated: galvanized (12 µm)
Washer:	Z16– carbon steel washer with EPDM ring
Saddle washer:	ESW made of aluminum
Component I:	S280GD, S320GD or S350GD – EN 10346
Component II:	S235 to S355 – EN 10025-1 S280GD, S320GD or S350GD – EN 10346

Drilling capacity: $\Sigma(t_{N2} + t_{II}) \leq 25$ mm

Timber substructures
no performance assessed



$t_{N,II}$ [mm]		4.00	5.00	6.00	8.00	10.00	12.00	15.00	20.00	24.00
$V_{R,k}$ [kN] for $t_{N,I}$ [mm]	0.40	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84
	0.50	1.72	1.72	1.72	1.72	1.72	1.72	1.72	1.72	1.72
	0.55	1.72	1.72	1.72	1.72	1.72	1.72	1.72	1.72	1.72
	0.60	1.72	1.72	1.72	1.72	1.72	1.72	1.72	1.72	1.72
	0.63	1.90	1.90	1.90	1.90	1.90	1.90	1.90	1.90	1.90
	0.70	1.99	1.99	1.99	1.99	1.99	1.99	1.99	1.99	1.99
	0.75	2.69	2.69	2.69	2.69	2.69	2.69	2.69	2.69	2.69
	0.88	2.69	2.69	2.69	2.69	2.69	2.69	2.69	2.69	2.69
	1.00	3.10	3.10	3.10	3.10	3.10	3.10	3.10	3.10	3.10
$N_{R,k}$ [kN] for $t_{N,I}$ [mm]	0.40	8.02	8.02	10.53	10.53	10.53	10.53	10.53	10.53	10.53
	0.50	8.02	8.02	10.92	10.92	10.92	10.92	10.92	10.92	10.92
	0.55	8.02	8.02	10.92	10.92	10.92	10.92	10.92	10.92	10.92
	0.60	8.02	8.02	10.92	10.92	10.92	10.92	10.92	10.92	10.92
	0.63	8.02	8.02	10.92	10.92	10.92	10.92	10.92	10.92	10.92
	0.70	8.02	8.02	10.92	10.92	10.92	10.92	10.92	10.92	10.92
	0.75	8.02	8.02	10.92	10.92	10.92	10.92	10.92	10.92	10.92
	0.88	8.02	8.02	10.92	10.92	10.92	10.92	10.92	10.92	10.92
	1.00	8.02	8.02	10.92	10.92	10.92	10.92	10.92	10.92	10.92
$N_{R\,II,k}$ [kN]		8.02	8.02	12.65	12.65	12.65	12.65	12.65	12.65	12.65
max. head displacement "u" depending on sandwich panel thickness [mm]	30	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7
	40	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9
	50	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2
	60	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4
	70	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6
	80	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8
	90	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1
	100	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3
	110	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5
	120	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8
	130	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
	≥140	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2

Fastening screws for sandwich panels

Self-drilling screws ESPS-25-Z 6,3/5,5xL with hexagon head, washer Z16 and saddle washer ESW

Annex 109

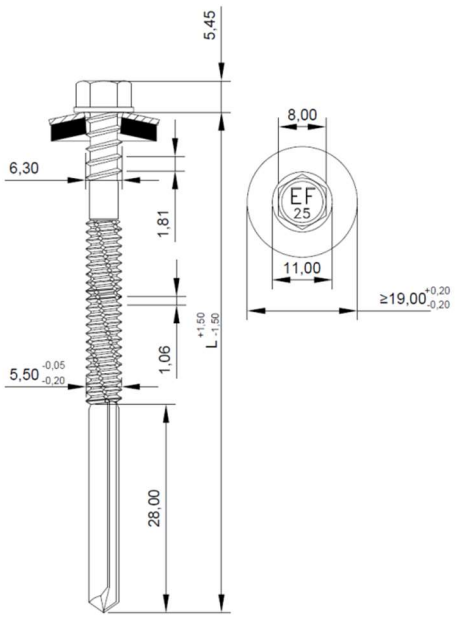
of European Technical Assessment ETA-16/0734

Materials

Fastener:	carbon steel – SAE1022, quenched, tempered and coated: galvanized with PREMIUM coating
Washer:	A19, A22, A25, A29 – aluminum washer with EPDM ring
Component I:	S280GD, S320GD or S350GD – EN 10346
Component II:	S235 to S355 – EN 10025-1 S280GD, S320GD or S350GD – EN 10346

Drilling capacity: $\Sigma(t_{N2} + t_{II}) \leq 25$ mm

Timber substructures
no performance assessed



$t_{N,II}$ [mm]		4.00	5.00	6.00	8.00	10.00	12.00	15.00	20.00	24.00
$V_{R,k}$ [kN] for $t_{N,I}$ [mm]	0.40	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84
	0.50	1.72	1.72	1.72	1.72	1.72	1.72	1.72	1.72	1.72
	0.55	1.72	1.72	1.72	1.72	1.72	1.72	1.72	1.72	1.72
	0.60	1.72	1.72	1.72	1.72	1.72	1.72	1.72	1.72	1.72
	0.63	1.90	1.90	1.90	1.90	1.90	1.90	1.90	1.90	1.90
	0.70	1.99	1.99	1.99	1.99	1.99	1.99	1.99	1.99	1.99
	0.75	2.69	2.69	2.69	2.69	2.69	2.69	2.69	2.69	2.69
	0.88	2.69	2.69	2.69	2.69	2.69	2.69	2.69	2.69	2.69
	1.00	3.10	3.10	3.10	3.10	3.10	3.10	3.10	3.10	3.10
$N_{R,k}$ [kN] for $t_{N,I}$ [mm]	0.40	1.81	1.81	1.81	1.81	1.81	1.81	1.81	1.81	1.81
	0.50	4.14	4.14	4.14	4.14	4.14	4.14	4.14	4.14	4.14
	0.55	4.14	4.14	4.14	4.14	4.14	4.14	4.14	4.14	4.14
	0.60	4.14	4.14	4.14	4.14	4.14	4.14	4.14	4.14	4.14
	0.63	5.10	5.10	5.10	5.10	5.10	5.10	5.10	5.10	5.10
	0.70	5.50	5.50	5.50	5.50	5.50	5.50	5.50	5.50	5.50
	0.75	7.70	7.70	7.70	7.70	7.70	7.70	7.70	7.70	7.70
	0.88	7.70	7.70	7.70	7.70	7.70	7.70	7.70	7.70	7.70
	1.00	7.78	7.78	7.78	7.78	7.78	7.78	7.78	7.78	7.78
$N_{R\,II,k}$ [kN]		8.02	8.02	12.65	12.65	12.65	12.65	12.65	12.65	12.65
max. head displacement "u" depending on sandwich panel thickness [mm]	30	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7
	40	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9
	50	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2
	60	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4
	70	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6
	80	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8
	90	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1
	100	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3
	110	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5
	120	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8
	130	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
	≥140	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2

Fastening screws for sandwich panels

Self-drilling screws ESPS-25-P 6,3/5,5xL with hexagon head and washer A19, A22, A25 or A29

Annex 110

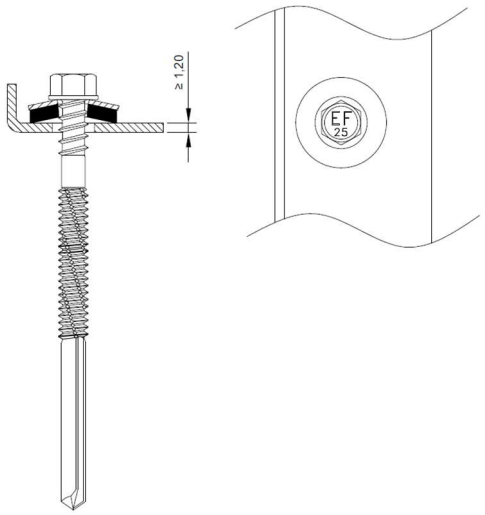
of European Technical Assessment ETA-16/0734

Materials

Fastener:	carbon steel – SAE1022, quenched, tempered and coated: galvanized with PREMIUM coating
Washer:	A19, A22, A25, A29 – aluminum washer with EPDM ring
Linear washer:	ELW-Z made of carbon steel – $R_{0,2} \geq 200$ MPa and galvanized min. 200 g/m^2 ELW-S made of stainless steel A2 – EN ISO 3506
Component I:	S280GD, S320GD or S350GD – EN 10346
Component II:	S235 to S355 – EN 10025-1 S280GD, S320GD or S350GD – EN 10346

Drilling capacity: $\Sigma(t_{N2} + t_{II}) \leq 25$ mm

Timber substructures
no performance assessed



$t_{N,II}$ [mm]		4.00	5.00	6.00	8.00	10.00	12.00	15.00	20.00	24.00
$V_{R,k}$ [kN] for $t_{N,I}$ [mm]	0.40	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84
	0.50	1.72	1.72	1.72	1.72	1.72	1.72	1.72	1.72	1.72
	0.55	1.72	1.72	1.72	1.72	1.72	1.72	1.72	1.72	1.72
	0.60	1.72	1.72	1.72	1.72	1.72	1.72	1.72	1.72	1.72
	0.63	1.90	1.90	1.90	1.90	1.90	1.90	1.90	1.90	1.90
	0.70	1.99	1.99	1.99	1.99	1.99	1.99	1.99	1.99	1.99
	0.75	2.69	2.69	2.69	2.69	2.69	2.69	2.69	2.69	2.69
	0.88	2.69	2.69	2.69	2.69	2.69	2.69	2.69	2.69	2.69
	1.00	3.10	3.10	3.10	3.10	3.10	3.10	3.10	3.10	3.10
$N_{R,k}$ [kN] for $t_{N,I}$ [mm]	0.40	7.78	7.78	7.78	7.78	7.78	7.78	7.78	7.78	7.78
	0.50	7.78	7.78	7.78	7.78	7.78	7.78	7.78	7.78	7.78
	0.55	7.78	7.78	7.78	7.78	7.78	7.78	7.78	7.78	7.78
	0.60	7.78	7.78	7.78	7.78	7.78	7.78	7.78	7.78	7.78
	0.63	7.78	7.78	7.78	7.78	7.78	7.78	7.78	7.78	7.78
	0.70	7.78	7.78	7.78	7.78	7.78	7.78	7.78	7.78	7.78
	0.75	7.78	7.78	7.78	7.78	7.78	7.78	7.78	7.78	7.78
	0.88	7.78	7.78	7.78	7.78	7.78	7.78	7.78	7.78	7.78
	1.00	7.78	7.78	7.78	7.78	7.78	7.78	7.78	7.78	7.78
$N_{R\,II,k}$ [kN]		8.02	8.02	12.65	12.65	12.65	12.65	12.65	12.65	12.65
max. head displacement "u" depending on sandwich panel thickness [mm]	30	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7
	40	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9
	50	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2
	60	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4
	70	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6
	80	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8
	90	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1
	100	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3
	110	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5
	120	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8
	130	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
	≥140	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2

Fastening screws for sandwich panels

Self-drilling screws ESPS-25-P 6,3/5,5xL with hexagon head, washer A19, A22, A25 or A29 and linear washer ELW-Z or ELW-S

Annex 111

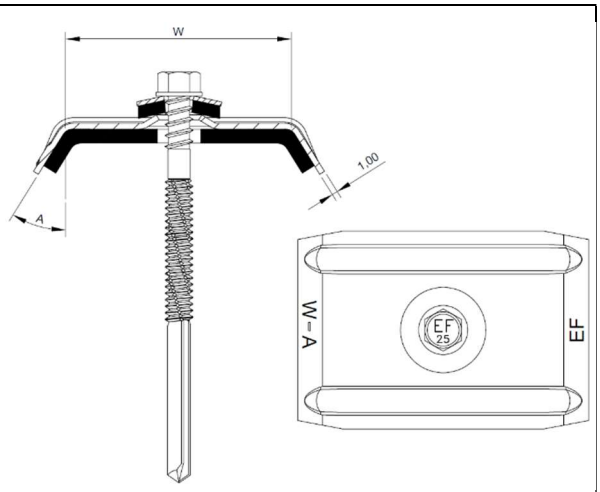
of European Technical Assessment ETA-16/0734

Materials

Fastener:	carbon steel – SAE1022, quenched, tempered and coated: galvanized with PREMIUM coating
Washer:	A19, A22, A25, A29 – aluminum washer with EPDM ring
Saddle washer:	ESW made of aluminum
Component I:	S280GD, S320GD or S350GD – EN 10346
Component II:	S235 to S355 – EN 10025-1 S280GD, S320GD or S350GD – EN 10346

Drilling capacity: $\Sigma(t_{N2} + t_{II}) \leq 25$ mm

Timber substructures
no performance assessed



$t_{N,II}$ [mm]		4.00	5.00	6.00	8.00	10.00	12.00	15.00	20.00	24.00
$V_{R,k}$ [kN] for $t_{N,I}$ [mm]	0.40	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84
	0.50	1.72	1.72	1.72	1.72	1.72	1.72	1.72	1.72	1.72
	0.55	1.72	1.72	1.72	1.72	1.72	1.72	1.72	1.72	1.72
	0.60	1.72	1.72	1.72	1.72	1.72	1.72	1.72	1.72	1.72
	0.63	1.90	1.90	1.90	1.90	1.90	1.90	1.90	1.90	1.90
	0.70	1.99	1.99	1.99	1.99	1.99	1.99	1.99	1.99	1.99
	0.75	2.69	2.69	2.69	2.69	2.69	2.69	2.69	2.69	2.69
	0.88	2.69	2.69	2.69	2.69	2.69	2.69	2.69	2.69	2.69
	1.00	3.10	3.10	3.10	3.10	3.10	3.10	3.10	3.10	3.10
$N_{R,k}$ [kN] for $t_{N,I}$ [mm]	0.40	8.02	8.02	10.14	10.14	10.14	10.14	10.14	10.14	10.14
	0.50	8.02	8.02	10.90	10.90	10.90	10.90	10.90	10.90	10.90
	0.55	8.02	8.02	10.90	10.90	10.90	10.90	10.90	10.90	10.90
	0.60	8.02	8.02	10.90	10.90	10.90	10.90	10.90	10.90	10.90
	0.63	8.02	8.02	10.90	10.90	10.90	10.90	10.90	10.90	10.90
	0.70	8.02	8.02	10.90	10.90	10.90	10.90	10.90	10.90	10.90
	0.75	8.02	8.02	10.90	10.90	10.90	10.90	10.90	10.90	10.90
	0.88	8.02	8.02	10.90	10.90	10.90	10.90	10.90	10.90	10.90
	1.00	8.02	8.02	10.90	10.90	10.90	10.90	10.90	10.90	10.90
$N_{R\,II,k}$ [kN]		8.02	8.02	12.65	12.65	12.65	12.65	12.65	12.65	12.65
max. head displacement "u" depending on sandwich panel thickness [mm]	30	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7
	40	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9
	50	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2
	60	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4
	70	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6
	80	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8
	90	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1
	100	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3
	110	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5
	120	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8
	130	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
	≥140	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2

Fastening screws for sandwich panels

Self-drilling screws ESPS-25-P 6,3/5,5xL with hexagon head, washer A19, A22, A25 or A29 and saddle washer ESW

Annex 112

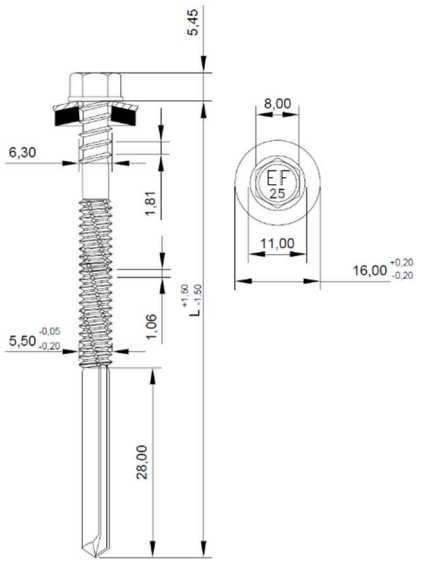
of European Technical Assessment ETA-16/0734

Materials

Fastener:	carbon steel – SAE1022, quenched, tempered and coated: galvanized with PREMIUM coating
Washer:	A16 – aluminum washer with EPDM ring
Component I:	S280GD, S320GD or S350GD – EN 10346
Component II:	S235 to S355 – EN 10025-1 S280GD, S320GD or S350GD – EN 10346

Drilling capacity: $\Sigma(t_{N2} + t_{II}) \leq 25$ mm

Timber substructures
no performance assessed



$t_{N,II}$ [mm]		4.00	5.00	6.00	8.00	10.00	12.00	15.00	20.00	24.00
$V_{R,k}$ [kN] for $t_{N,I}$ [mm]	0.40	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84
	0.50	1.72	1.72	1.72	1.72	1.72	1.72	1.72	1.72	1.72
	0.55	1.72	1.72	1.72	1.72	1.72	1.72	1.72	1.72	1.72
	0.60	1.72	1.72	1.72	1.72	1.72	1.72	1.72	1.72	1.72
	0.63	1.90	1.90	1.90	1.90	1.90	1.90	1.90	1.90	1.90
	0.70	1.99	1.99	1.99	1.99	1.99	1.99	1.99	1.99	1.99
	0.75	2.69	2.69	2.69	2.69	2.69	2.69	2.69	2.69	2.69
	0.88	2.69	2.69	2.69	2.69	2.69	2.69	2.69	2.69	2.69
	1.00	3.10	3.10	3.10	3.10	3.10	3.10	3.10	3.10	3.10
$N_{R,k}$ [kN] for $t_{N,I}$ [mm]	0.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40
	0.50	2.53	2.53	2.53	2.53	2.53	2.53	2.53	2.53	2.53
	0.55	2.53	2.53	2.53	2.53	2.53	2.53	2.53	2.53	2.53
	0.60	2.77	2.77	2.77	2.77	2.77	2.77	2.77	2.77	2.77
	0.63	2.77	2.77	2.77	2.77	2.77	2.77	2.77	2.77	2.77
	0.70	2.89	2.89	2.89	2.89	2.89	2.89	2.89	2.89	2.89
	0.75	2.89	2.89	2.89	2.89	2.89	2.89	2.89	2.89	2.89
	0.88	2.89	2.89	2.89	2.89	2.89	2.89	2.89	2.89	2.89
	1.00	4.27	4.27	4.27	4.27	4.27	4.27	4.27	4.27	4.27
$N_{R\,II,k}$ [kN]		8.02	8.02	12.65	12.65	12.65	12.65	12.65	12.65	12.65
max. head displacement "u" depending on sandwich panel thickness [mm]	30	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7
	40	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9
	50	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2
	60	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4
	70	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6
	80	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8
	90	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1
	100	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3
	110	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5
	120	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8
	130	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
	≥140	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2

Fastening screws for sandwich panels

Self-drilling screws ESPS-25-P 6,3/5,5xL with hexagon head and washer A16

Annex 113

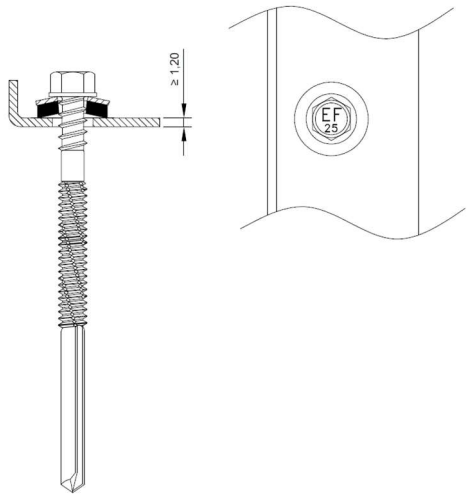
of European Technical Assessment ETA-16/0734

Materials

Fastener:	carbon steel – SAE1022, quenched, tempered and coated: galvanized with PREMIUM coating
Washer:	A16 – aluminum washer with EPDM ring
Linear washer:	ELW-Z made of carbon steel – $R_{0,2} \geq 200$ MPa and galvanized min. 200 g/m^2 ELW-S made of stainless steel A2 – EN ISO 3506
Component I:	S280GD, S320GD or S350GD – EN 10346
Component II:	S235 to S355 – EN 10025-1 S280GD, S320GD or S350GD – EN 10346

Drilling capacity: $\Sigma(t_{N2} + t_{II}) \leq 25$ mm

Timber substructures
no performance assessed



$t_{N,II}$ [mm]		4.00	5.00	6.00	8.00	10.00	12.00	15.00	20.00	24.00
$V_{R,k}$ [kN] for $t_{N,I}$ [mm]	0.40	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84
	0.50	1.72	1.72	1.72	1.72	1.72	1.72	1.72	1.72	1.72
	0.55	1.72	1.72	1.72	1.72	1.72	1.72	1.72	1.72	1.72
	0.60	1.72	1.72	1.72	1.72	1.72	1.72	1.72	1.72	1.72
	0.63	1.90	1.90	1.90	1.90	1.90	1.90	1.90	1.90	1.90
	0.70	1.99	1.99	1.99	1.99	1.99	1.99	1.99	1.99	1.99
	0.75	2.69	2.69	2.69	2.69	2.69	2.69	2.69	2.69	2.69
	0.88	2.69	2.69	2.69	2.69	2.69	2.69	2.69	2.69	2.69
	1.00	3.10	3.10	3.10	3.10	3.10	3.10	3.10	3.10	3.10
$N_{R,k}$ [kN] for $t_{N,I}$ [mm]	0.40	8.02	8.02	12.02	12.02	12.02	12.02	12.02	12.02	12.02
	0.50	8.02	8.02	12.02	12.02	12.02	12.02	12.02	12.02	12.02
	0.55	8.02	8.02	12.02	12.02	12.02	12.02	12.02	12.02	12.02
	0.60	8.02	8.02	12.02	12.02	12.02	12.02	12.02	12.02	12.02
	0.63	8.02	8.02	12.02	12.02	12.02	12.02	12.02	12.02	12.02
	0.70	8.02	8.02	12.02	12.02	12.02	12.02	12.02	12.02	12.02
	0.75	8.02	8.02	12.02	12.02	12.02	12.02	12.02	12.02	12.02
	0.88	8.02	8.02	12.02	12.02	12.02	12.02	12.02	12.02	12.02
	1.00	8.02	8.02	12.02	12.02	12.02	12.02	12.02	12.02	12.02
$N_{R\,II,k}$ [kN]		8.02	8.02	12.65	12.65	12.65	12.65	12.65	12.65	12.65
max. head displacement "u" depending on sandwich panel thickness [mm]	30	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7
	40	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9
	50	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2
	60	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4
	70	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6
	80	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8
	90	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1
	100	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3
	110	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5
	120	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8
	130	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
	≥140	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2

Fastening screws for sandwich panels

Self-drilling screws ESPS-25-P 6,3/5,5xL with hexagon head, washer A16 and linear washer ELW-Z or ELW-S

Annex 114

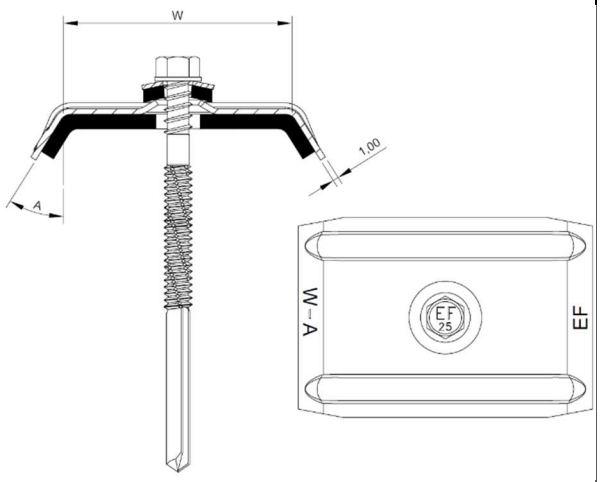
of European Technical Assessment ETA-16/0734

Materials

Fastener:	carbon steel – SAE1022, quenched, tempered and coated: galvanized with PREMIUM coating
Washer:	A16– aluminum washer with EPDM ring
Saddle washer:	ESW made of aluminum
Component I:	S280GD, S320GD or S350GD – EN 10346
Component II:	S235 to S355 – EN 10025-1 S280GD, S320GD or S350GD – EN 10346

Drilling capacity: $\Sigma(t_{N2} + t_{II}) \leq 25$ mm

Timber substructures
no performance assessed



$t_{N,II}$ [mm]		4.00	5.00	6.00	8.00	10.00	12.00	15.00	20.00	24.00
$V_{R,k}$ [kN] for $t_{N,I}$ [mm]	0.40	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84
	0.50	1.72	1.72	1.72	1.72	1.72	1.72	1.72	1.72	1.72
	0.55	1.72	1.72	1.72	1.72	1.72	1.72	1.72	1.72	1.72
	0.60	1.72	1.72	1.72	1.72	1.72	1.72	1.72	1.72	1.72
	0.63	1.90	1.90	1.90	1.90	1.90	1.90	1.90	1.90	1.90
	0.70	1.99	1.99	1.99	1.99	1.99	1.99	1.99	1.99	1.99
	0.75	2.69	2.69	2.69	2.69	2.69	2.69	2.69	2.69	2.69
	0.88	2.69	2.69	2.69	2.69	2.69	2.69	2.69	2.69	2.69
	1.00	3.10	3.10	3.10	3.10	3.10	3.10	3.10	3.10	3.10
$N_{R,k}$ [kN] for $t_{N,I}$ [mm]	0.40	8.02	8.02	10.53	10.53	10.53	10.53	10.53	10.53	10.53
	0.50	8.02	8.02	10.92	10.92	10.92	10.92	10.92	10.92	10.92
	0.55	8.02	8.02	10.92	10.92	10.92	10.92	10.92	10.92	10.92
	0.60	8.02	8.02	10.92	10.92	10.92	10.92	10.92	10.92	10.92
	0.63	8.02	8.02	10.92	10.92	10.92	10.92	10.92	10.92	10.92
	0.70	8.02	8.02	10.92	10.92	10.92	10.92	10.92	10.92	10.92
	0.75	8.02	8.02	10.92	10.92	10.92	10.92	10.92	10.92	10.92
	0.88	8.02	8.02	10.92	10.92	10.92	10.92	10.92	10.92	10.92
	1.00	8.02	8.02	10.92	10.92	10.92	10.92	10.92	10.92	10.92
$N_{R\ II,k}$ [kN]		8.02	8.02	12.65	12.65	12.65	12.65	12.65	12.65	12.65
max. head displacement "u" depending on sandwich panel thickness [mm]	30	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7
	40	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9
	50	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2
	60	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4
	70	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6
	80	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8
	90	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1
	100	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3
	110	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5
	120	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8
	130	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
	≥140	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2

Fastening screws for sandwich panels

Self-drilling screws ESPS-25-P 6,3/5,5xL with hexagon head, washer A16 and saddle washer ESW

Annex 115

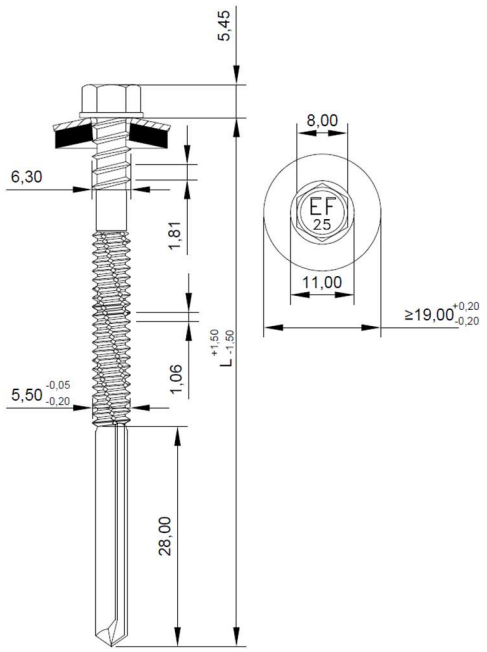
of European Technical Assessment ETA-16/0734

Materials

Fastener:	carbon steel – SAE1022, quenched, tempered and coated: galvanized with SUPER PREMIUM coating
Washer:	S19, S22, S25, S29 – stainless steel washer with EPDM ring or A19, A22, A25, A29 – aluminum washer with EPDM ring
Component I:	S280GD, S320GD or S350GD – EN 10346
Component II:	S235 to S355 – EN 10025-1 S280GD, S320GD or S350GD – EN 10346

Drilling capacity: $\Sigma(t_{N2} + t_{II}) \leq 25$ mm

Timber substructures
no performance assessed



$t_{N,II}$ [mm]		4.00	5.00	6.00	8.00	10.00	12.00	15.00	20.00	24.00
$V_{R,k}$ [kN] for $t_{N,I}$ [mm]	0.40	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84
	0.50	1.72	1.72	1.72	1.72	1.72	1.72	1.72	1.72	1.72
	0.55	1.72	1.72	1.72	1.72	1.72	1.72	1.72	1.72	1.72
	0.60	1.72	1.72	1.72	1.72	1.72	1.72	1.72	1.72	1.72
	0.63	1.90	1.90	1.90	1.90	1.90	1.90	1.90	1.90	1.90
	0.70	1.99	1.99	1.99	1.99	1.99	1.99	1.99	1.99	1.99
	0.75	2.69	2.69	2.69	2.69	2.69	2.69	2.69	2.69	2.69
	0.88	2.69	2.69	2.69	2.69	2.69	2.69	2.69	2.69	2.69
	1.00	3.10	3.10	3.10	3.10	3.10	3.10	3.10	3.10	3.10
$N_{R,k}$ [kN] for $t_{N,I}$ [mm]	0.40	1.81	1.81	1.81	1.81	1.81	1.81	1.81	1.81	1.81
	0.50	4.14	4.14	4.14	4.14	4.14	4.14	4.14	4.14	4.14
	0.55	4.14	4.14	4.14	4.14	4.14	4.14	4.14	4.14	4.14
	0.60	4.14	4.14	4.14	4.14	4.14	4.14	4.14	4.14	4.14
	0.63	5.10	5.10	5.10	5.10	5.10	5.10	5.10	5.10	5.10
	0.70	5.50	5.50	5.50	5.50	5.50	5.50	5.50	5.50	5.50
	0.75	7.70	7.70	7.70	7.70	7.70	7.70	7.70	7.70	7.70
	0.88	7.70	7.70	7.70	7.70	7.70	7.70	7.70	7.70	7.70
	1.00	7.78	7.78	7.78	7.78	7.78	7.78	7.78	7.78	7.78
$N_{R\,II,k}$ [kN]		8.02	8.02	12.65	12.65	12.65	12.65	12.65	12.65	12.65
max. head displacement "u" depending on sandwich panel thickness [mm]	30	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7
	40	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9
	50	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2
	60	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4
	70	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6
	80	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8
	90	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1
	100	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3
	110	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5
	120	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8
	130	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
	≥140	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2

Fastening screws for sandwich panels

Self-drilling screws ESPS-25-SP 6,3/5,5xL with hexagon head, washer S19, S22, S25, S29, A19, A22, A25 or A29

Annex 116

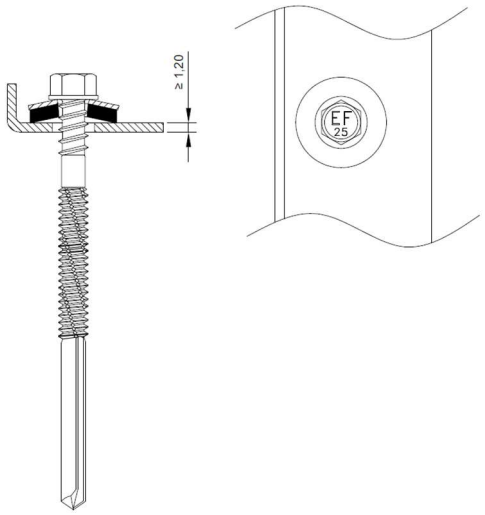
of European Technical Assessment ETA-16/0734

Materials

Fastener:	carbon steel – SAE1022, quenched, tempered and coated: galvanized with SUPER PREMIUM coating
Washer:	S19, S22, S25, S29 – stainless steel washer with EPDM ring or A19, A22, A25, A29 – aluminum washer with EPDM ring
Linear washer:	ELW-Z made of carbon steel – $R_{0,2} \geq 200$ MPa and galvanized min. 200 g/m^2 ELW-S made of stainless steel A2 – EN ISO 3506
Component I:	S280GD, S320GD or S350GD – EN 10346
Component II:	S235 to S355 – EN 10025-1 S280GD, S320GD or S350GD – EN 10346

Drilling capacity: $\Sigma(t_{N2} + t_{II}) \leq 25$ mm

Timber substructures
no performance assessed



$t_{N,II}$ [mm]		4.00	5.00	6.00	8.00	10.00	12.00	15.00	20.00	24.00
$V_{R,k}$ [kN] for $t_{N,I}$ [mm]	0.40	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84
	0.50	1.72	1.72	1.72	1.72	1.72	1.72	1.72	1.72	1.72
	0.55	1.72	1.72	1.72	1.72	1.72	1.72	1.72	1.72	1.72
	0.60	1.72	1.72	1.72	1.72	1.72	1.72	1.72	1.72	1.72
	0.63	1.90	1.90	1.90	1.90	1.90	1.90	1.90	1.90	1.90
	0.70	1.99	1.99	1.99	1.99	1.99	1.99	1.99	1.99	1.99
	0.75	2.69	2.69	2.69	2.69	2.69	2.69	2.69	2.69	2.69
	0.88	2.69	2.69	2.69	2.69	2.69	2.69	2.69	2.69	2.69
	1.00	3.10	3.10	3.10	3.10	3.10	3.10	3.10	3.10	3.10
$N_{R,k}$ [kN] for $t_{N,I}$ [mm]	0.40	7.78	7.78	7.78	7.78	7.78	7.78	7.78	7.78	7.78
	0.50	7.78	7.78	7.78	7.78	7.78	7.78	7.78	7.78	7.78
	0.55	7.78	7.78	7.78	7.78	7.78	7.78	7.78	7.78	7.78
	0.60	7.78	7.78	7.78	7.78	7.78	7.78	7.78	7.78	7.78
	0.63	7.78	7.78	7.78	7.78	7.78	7.78	7.78	7.78	7.78
	0.70	7.78	7.78	7.78	7.78	7.78	7.78	7.78	7.78	7.78
	0.75	7.78	7.78	7.78	7.78	7.78	7.78	7.78	7.78	7.78
	0.88	7.78	7.78	7.78	7.78	7.78	7.78	7.78	7.78	7.78
	1.00	7.78	7.78	7.78	7.78	7.78	7.78	7.78	7.78	7.78
$N_{R\ II,k}$ [kN]		8.02	8.02	12.65	12.65	12.65	12.65	12.65	12.65	12.65
max. head displacement "u" depending on sandwich panel thickness [mm]	30	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7
	40	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9
	50	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2
	60	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4
	70	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6
	80	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8
	90	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1
	100	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3
	110	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5
	120	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8
	130	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
	≥140	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2

Fastening screws for sandwich panels

Self-drilling screws ESPS-25-SP 6,3/5,5xL with hexagon head, washer S19, S22, S25, S29, A19, A22, A25 or A29 and linear washer ELW-Z or ELW-S

Annex 117

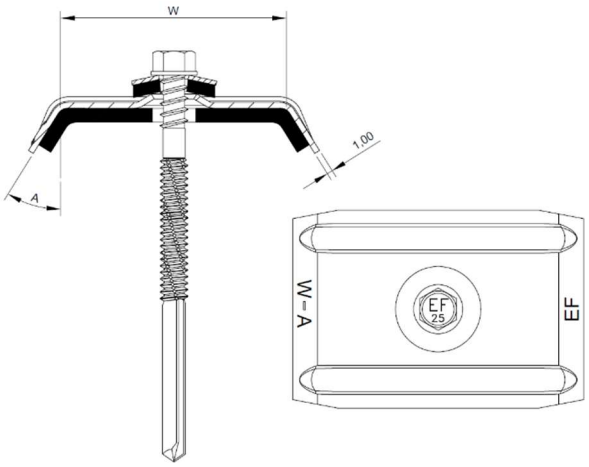
of European Technical Assessment ETA-16/0734

Materials

Fastener:	carbon steel – SAE1022, quenched, tempered and coated: galvanized with SUPER PREMIUM coating
Washer:	S19, S22, S25, S29 – stainless steel washer with EPDM ring or A19, A22, A25, A29 – aluminum washer with EPDM ring
Saddle washer:	ESW made of aluminum
Component I:	S280GD, S320GD or S350GD – EN 10346
Component II:	S235 to S355 – EN 10025-1 S280GD, S320GD or S350GD – EN 10346

Drilling capacity: $\Sigma(t_{N2} + t_{II}) \leq 25$ mm

Timber substructures
no performance assessed



$t_{N,II}$ [mm]		4.00	5.00	6.00	8.00	10.00	12.00	15.00	20.00	24.00
$V_{R,k}$ [kN] for $t_{N,I}$ [mm]	0.40	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84
	0.50	1.72	1.72	1.72	1.72	1.72	1.72	1.72	1.72	1.72
	0.55	1.72	1.72	1.72	1.72	1.72	1.72	1.72	1.72	1.72
	0.60	1.72	1.72	1.72	1.72	1.72	1.72	1.72	1.72	1.72
	0.63	1.90	1.90	1.90	1.90	1.90	1.90	1.90	1.90	1.90
	0.70	1.99	1.99	1.99	1.99	1.99	1.99	1.99	1.99	1.99
	0.75	2.69	2.69	2.69	2.69	2.69	2.69	2.69	2.69	2.69
	0.88	2.69	2.69	2.69	2.69	2.69	2.69	2.69	2.69	2.69
	1.00	3.10	3.10	3.10	3.10	3.10	3.10	3.10	3.10	3.10
$N_{R,k}$ [kN] for $t_{N,I}$ [mm]	0.40	8.02	8.02	10.14	10.14	10.14	10.14	10.14	10.14	10.14
	0.50	8.02	8.02	10.90	10.90	10.90	10.90	10.90	10.90	10.90
	0.55	8.02	8.02	10.90	10.90	10.90	10.90	10.90	10.90	10.90
	0.60	8.02	8.02	10.90	10.90	10.90	10.90	10.90	10.90	10.90
	0.63	8.02	8.02	10.90	10.90	10.90	10.90	10.90	10.90	10.90
	0.70	8.02	8.02	10.90	10.90	10.90	10.90	10.90	10.90	10.90
	0.75	8.02	8.02	10.90	10.90	10.90	10.90	10.90	10.90	10.90
	0.88	8.02	8.02	10.90	10.90	10.90	10.90	10.90	10.90	10.90
	1.00	8.02	8.02	10.90	10.90	10.90	10.90	10.90	10.90	10.90
$N_{R\ II,k}$ [kN]		8.02	8.02	12.65	12.65	12.65	12.65	12.65	12.65	12.65
max. head displacement "u" depending on sandwich panel thickness [mm]	30	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7
	40	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9
	50	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2
	60	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4
	70	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6
	80	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8
	90	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1
	100	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3
	110	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5
	120	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8
	130	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
	≥140	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2

Fastening screws for sandwich panels

Self-drilling screws ESPS-25-SP 6,3/5,5xL with hexagon head, washer S19, S22, S25, S29, A19, A22, A25 or A29 and saddle washer ESW

Annex 118

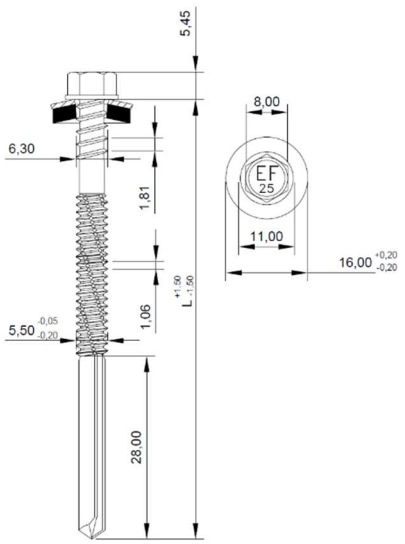
of European Technical Assessment ETA-16/0734

Materials

Fastener:	carbon steel – SAE1022, quenched, tempered and coated: galvanized with SUPER PREMIUM coating
Washer:	S16 – stainless steel washer with EPDM ring or A16 – aluminum washer with EPDM ring
Component I:	S280GD, S320GD or S350GD – EN 10346
Component II:	S235 to S355 – EN 10025-1 S280GD, S320GD or S350GD – EN 10346

Drilling capacity: $\Sigma(t_{N2} + t_{II}) \leq 25$ mm

Timber substructures
no performance assessed



$t_{N,II}$ [mm]		4.00	5.00	6.00	8.00	10.00	12.00	15.00	20.00	24.00
$V_{R,k}$ [kN] for $t_{N,I}$ [mm]	0.40	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84
	0.50	1.72	1.72	1.72	1.72	1.72	1.72	1.72	1.72	1.72
	0.55	1.72	1.72	1.72	1.72	1.72	1.72	1.72	1.72	1.72
	0.60	1.72	1.72	1.72	1.72	1.72	1.72	1.72	1.72	1.72
	0.63	1.90	1.90	1.90	1.90	1.90	1.90	1.90	1.90	1.90
	0.70	1.99	1.99	1.99	1.99	1.99	1.99	1.99	1.99	1.99
	0.75	2.69	2.69	2.69	2.69	2.69	2.69	2.69	2.69	2.69
	0.88	2.69	2.69	2.69	2.69	2.69	2.69	2.69	2.69	2.69
	1.00	3.10	3.10	3.10	3.10	3.10	3.10	3.10	3.10	3.10
$N_{R,k}$ [kN] for $t_{N,I}$ [mm]	0.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40
	0.50	2.53	2.53	2.53	2.53	2.53	2.53	2.53	2.53	2.53
	0.55	2.53	2.53	2.53	2.53	2.53	2.53	2.53	2.53	2.53
	0.60	2.77	2.77	2.77	2.77	2.77	2.77	2.77	2.77	2.77
	0.63	2.77	2.77	2.77	2.77	2.77	2.77	2.77	2.77	2.77
	0.70	2.89	2.89	2.89	2.89	2.89	2.89	2.89	2.89	2.89
	0.75	2.89	2.89	2.89	2.89	2.89	2.89	2.89	2.89	2.89
	0.88	2.89	2.89	2.89	2.89	2.89	2.89	2.89	2.89	2.89
	1.00	4.27	4.27	4.27	4.27	4.27	4.27	4.27	4.27	4.27
$N_{R\,II,k}$ [kN]		8.02	8.02	12.65	12.65	12.65	12.65	12.65	12.65	12.65
max. head displacement "u" depending on sandwich panel thickness [mm]	30	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7
	40	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9
	50	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2
	60	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4
	70	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6
	80	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8
	90	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1
	100	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3
	110	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5
	120	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8
	130	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
	≥140	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2

Fastening screws for sandwich panels

Self-drilling screws ESPS-25-SP 6,3/5,5xL with hexagon head and washer S16 or A16

Annex 119

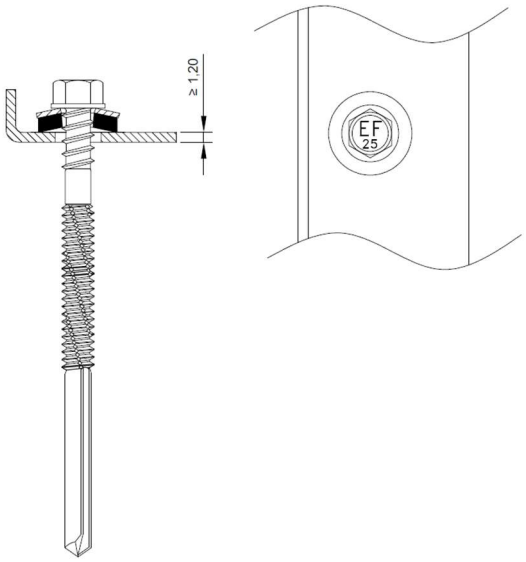
of European Technical Assessment ETA-16/0734

Materials

Fastener:	carbon steel – SAE1022, quenched, tempered and coated: galvanized with SUPER PREMIUM coating
Washer:	S16 – stainless steel washer with EPDM ring or A16 – aluminum washer with EPDM ring
Linear washer:	ELW-Z made of carbon steel – $R_{0,2} \geq 200$ MPa and galvanized min. 200 g/m^2 ELW-S made of stainless steel A2 – EN ISO 3506
Component I:	S280GD, S320GD or S350GD – EN 10346
Component II:	S235 to S355 – EN 10025-1 S280GD, S320GD or S350GD – EN 10346

Drilling capacity: $\Sigma(t_{N2} + t_{II}) \leq 25$ mm

Timber substructures
no performance assessed



$t_{N,II}$ [mm]		4.00	5.00	6.00	8.00	10.00	12.00	15.00	20.00	24.00
$V_{R,k}$ [kN] for $t_{N,I}$ [mm]	0.40	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84
	0.50	1.72	1.72	1.72	1.72	1.72	1.72	1.72	1.72	1.72
	0.55	1.72	1.72	1.72	1.72	1.72	1.72	1.72	1.72	1.72
	0.60	1.72	1.72	1.72	1.72	1.72	1.72	1.72	1.72	1.72
	0.63	1.90	1.90	1.90	1.90	1.90	1.90	1.90	1.90	1.90
	0.70	1.99	1.99	1.99	1.99	1.99	1.99	1.99	1.99	1.99
	0.75	2.69	2.69	2.69	2.69	2.69	2.69	2.69	2.69	2.69
	0.88	2.69	2.69	2.69	2.69	2.69	2.69	2.69	2.69	2.69
	1.00	3.10	3.10	3.10	3.10	3.10	3.10	3.10	3.10	3.10
$N_{R,k}$ [kN] for $t_{N,I}$ [mm]	0.40	8.02	8.02	12.02	12.02	12.02	12.02	12.02	12.02	12.02
	0.50	8.02	8.02	12.02	12.02	12.02	12.02	12.02	12.02	12.02
	0.55	8.02	8.02	12.02	12.02	12.02	12.02	12.02	12.02	12.02
	0.60	8.02	8.02	12.02	12.02	12.02	12.02	12.02	12.02	12.02
	0.63	8.02	8.02	12.02	12.02	12.02	12.02	12.02	12.02	12.02
	0.70	8.02	8.02	12.02	12.02	12.02	12.02	12.02	12.02	12.02
	0.75	8.02	8.02	12.02	12.02	12.02	12.02	12.02	12.02	12.02
	0.88	8.02	8.02	12.02	12.02	12.02	12.02	12.02	12.02	12.02
	1.00	8.02	8.02	12.02	12.02	12.02	12.02	12.02	12.02	12.02
$N_{R\,II,k}$ [kN]		8.02	8.02	12.65	12.65	12.65	12.65	12.65	12.65	12.65
max. head displacement "u" depending on sandwich panel thickness [mm]	30	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7
	40	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9
	50	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2
	60	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4
	70	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6
	80	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8
	90	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1
	100	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3
	110	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5
	120	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8
	130	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
	≥140	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2

Fastening screws for sandwich panels

Self-drilling screws ESPS-25-SP 6,3/5,5xL with hexagon head, washer S16 or A16 and linear washer ELW-Z or ELW-S

Annex 120

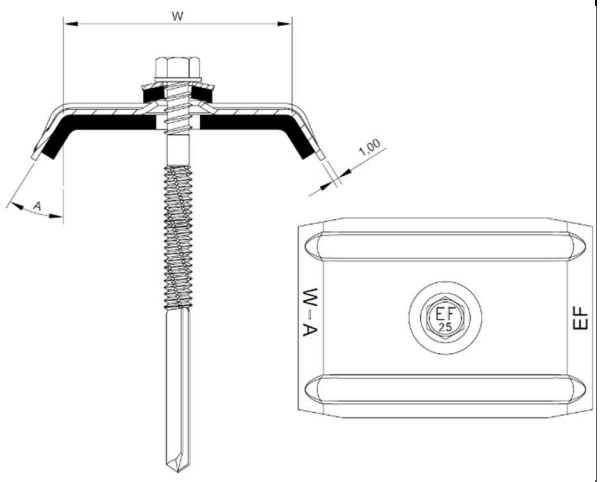
of European Technical Assessment ETA-16/0734

Materials

Fastener:	carbon steel – SAE1022, quenched, tempered and coated: galvanized with SUPER PREMIUM coating
Washer:	S16 – stainless steel washer with EPDM ring or A16 – aluminum washer with EPDM ring
Saddle washer:	ESW made of aluminum
Component I:	S280GD, S320GD or S350GD – EN 10346
Component II:	S235 to S355 – EN 10025-1 S280GD, S320GD or S350GD – EN 10346

Drilling capacity: $\Sigma(t_{N2} + t_{II}) \leq 25$ mm

Timber substructures
no performance assessed



$t_{N,II}$ [mm]		4.00	5.00	6.00	8.00	10.00	12.00	15.00	20.00	24.00
$V_{R,k}$ [kN] for $t_{N,I}$ [mm]	0.40	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84
	0.50	1.72	1.72	1.72	1.72	1.72	1.72	1.72	1.72	1.72
	0.55	1.72	1.72	1.72	1.72	1.72	1.72	1.72	1.72	1.72
	0.60	1.72	1.72	1.72	1.72	1.72	1.72	1.72	1.72	1.72
	0.63	1.90	1.90	1.90	1.90	1.90	1.90	1.90	1.90	1.90
	0.70	1.99	1.99	1.99	1.99	1.99	1.99	1.99	1.99	1.99
	0.75	2.69	2.69	2.69	2.69	2.69	2.69	2.69	2.69	2.69
	0.88	2.69	2.69	2.69	2.69	2.69	2.69	2.69	2.69	2.69
	1.00	3.10	3.10	3.10	3.10	3.10	3.10	3.10	3.10	3.10
$N_{R,k}$ [kN] for $t_{N,I}$ [mm]	0.40	8.02	8.02	10.53	10.53	10.53	10.53	10.53	10.53	10.53
	0.50	8.02	8.02	10.92	10.92	10.92	10.92	10.92	10.92	10.92
	0.55	8.02	8.02	10.92	10.92	10.92	10.92	10.92	10.92	10.92
	0.60	8.02	8.02	10.92	10.92	10.92	10.92	10.92	10.92	10.92
	0.63	8.02	8.02	10.92	10.92	10.92	10.92	10.92	10.92	10.92
	0.70	8.02	8.02	10.92	10.92	10.92	10.92	10.92	10.92	10.92
	0.75	8.02	8.02	10.92	10.92	10.92	10.92	10.92	10.92	10.92
	0.88	8.02	8.02	10.92	10.92	10.92	10.92	10.92	10.92	10.92
	1.00	8.02	8.02	10.92	10.92	10.92	10.92	10.92	10.92	10.92
$N_{R\,II,k}$ [kN]		8.02	8.02	12.65	12.65	12.65	12.65	12.65	12.65	12.65
max. head displacement "u" depending on sandwich panel thickness [mm]	30	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7
	40	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9
	50	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2
	60	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4
	70	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6
	80	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8
	90	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1
	100	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3
	110	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5
	120	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8
	130	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
	≥140	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2

Fastening screws for sandwich panels

Self-drilling screws ESPS-25-SP 6,3/5,5xL with hexagon head washer S16 or A16 and saddle washer ESW

Annex 121

of European Technical Assessment ETA-16/0734

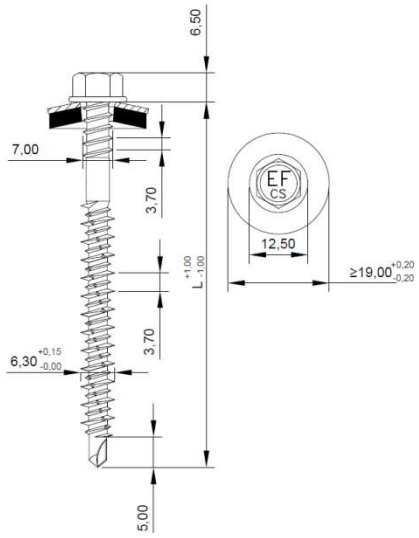
Materials

Fastener:	carbon steel – SAE1022, quenched, tempered and coated: galvanized (12 µm)
Washer:	Z19, Z22, Z25, Z29 – carbon steel washer with EPDM ring
Component I:	S280GD, S320GD or S320GD – EN 10346
Component II:	construction wood C24 – EN 14081

Drilling capacity: $\Sigma(t_{N2} + t_{II}) \leq 2 \times 1{,}00$ mm

Timber substructures

For timber structures performance assessed with
$M_{y,Rk}$ = 8,91 Nm
$f_{ax,k}$ = 14,408 N/mm² for $l_{ef} \geq 40$ mm



Component II: wood class ≥C24		$l_{ef} \geq 40$ [mm]	
$V_{R,k}$ [kN] for $t_{N,I}$ [mm]	0.40	0.84*	*Failure of component I **Failure of component II
	0.50	1.72*	
	0.55	1.72*	
	0.60	1.72*	
	0.63	1.90*	
	0.70	1.99*	
	0.75	2.69*	
	0.88	2.69*	
	1.00	3.10*	
$N_{R,k}$ [kN] for $t_{N,I}$ [mm]	0.40	1.81*	
	0.50	3.63**	
	0.55	3.63**	
	0.60	3.63**	
	0.63	3.63**	
	0.70	3.63**	
	0.75	3.63**	
	0.88	3.63**	
	1.00	3.63**	
$N_{R\,II,k}$ [kN]		3.63**	
max. head displacement "u" depending on sandwich panel thickness [mm]	30	0.7	
	40	0.9	
	50	1.2	
	60	1.4	
	70	1.6	
	80	1.8	
	90	2.1	
	100	2.3	
	110	2.5	
	120	2.8	
	130	3.0	
	≥140	3.2	

Fastening screws for sandwich panels

Self-drilling screws ESPS-CS2-Z 7,0/6,3xL with hexagon head and washer Z19, Z22, Z25 or Z29

Annex 122

of European Technical Assessment ETA-16/0734

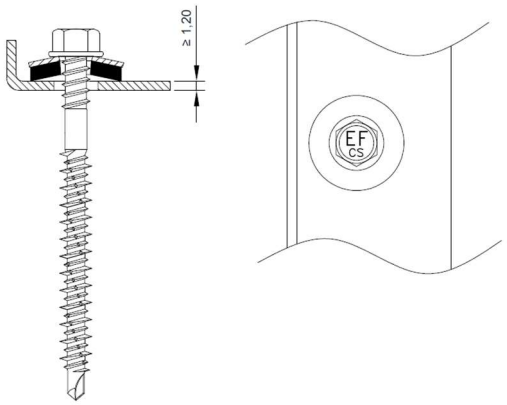
Materials

Fastener:	carbon steel – SAE1022, quenched, tempered and coated: galvanized (12 µm)
Washer:	Z19, Z22, Z25, Z29 – carbon steel washer with EPDM ring
Linear washer:	ELW-Z made of carbon steel – $R_{0,2}$ ≥ 200 MPa and galvanized min. 200 g/m² ELW-S made of stainless steel A2 – EN ISO 3506
Component I:	S280GD, S320GD or S320GD – EN 10346
Component II:	construction wood C24 – EN 14081

Drilling capacity: $\Sigma(t_{N2} + t_{II}) \leq 2 \times 1{,}00$ mm

Timber substructures

For timber structures performance assessed with
$M_{y,Rk}$ = 8,91 Nm
$f_{ax,k}$ = 14,408 N/mm² for l_{ef} ≥ 40 mm



Component II: wood class ≥C24		l_{ef} ≥ 40 [mm]	
$V_{R,k}$ [kN] for $t_{N,I}$ [mm]	0.40	0.84*	*Failure of component I **Failure of component II
	0.50	1.72*	
	0.55	1.72*	
	0.60	1.72*	
	0.63	1.90*	
	0.70	1.99*	
	0.75	2.69*	
	0.88	2.69*	
	1.00	3.10*	
$N_{R,k}$ [kN] for $t_{N,I}$ [mm]	0.40	3.63**	
	0.50	3.63**	
	0.55	3.63**	
	0.60	3.63**	
	0.63	3.63**	
	0.70	3.63**	
	0.75	3.63**	
	0.88	3.63**	
	1.00	3.63**	
$N_{R\,II,k}$ [kN]		3.63**	
max. head displacement "u" depending on sandwich panel thickness [mm]	30	0.7	
	40	0.9	
	50	1.2	
	60	1.4	
	70	1.6	
	80	1.8	
	90	2.1	
	100	2.3	
	110	2.5	
	120	2.8	
	130	3.0	
	≥140	3.2	

Fastening screws for sandwich panels

Self-drilling screws ESPS-CS2-Z 7,0/6,3xL with hexagon head, washer Z19, Z22, Z25 or Z29 and linear washer ELW-Z or ELW-S

Annex 123

of European Technical Assessment ETA-16/0734

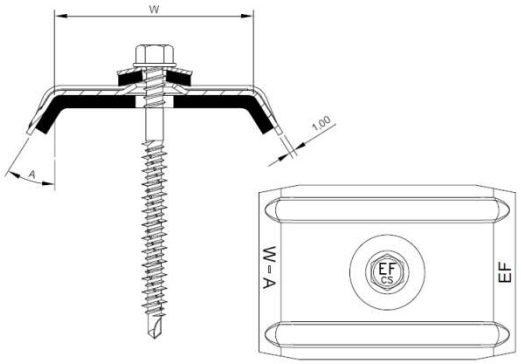
Materials

Fastener:	carbon steel – SAE1022, quenched, tempered and coated: galvanized (12 µm)
Washer:	Z19, Z22, Z25, Z29 – carbon steel washer with EPDM ring
Saddle washer:	ESW made of aluminum
Component I:	S280GD, S320GD or S350GD – EN 10346
Component II:	construction wood C24 – EN 14081

Drilling capacity: $\Sigma(t_{N2} + t_{II}) \leq 2 \times 1{,}00$ mm

Timber substructures

For timber structures performance assessed with
$M_{y,Rk}$ = 8,91 Nm
$f_{ax,k}$ = 14,408 N/mm² for $l_{ef} \geq 40$ mm



Component II: wood class ≥C24		$l_{ef} \geq 40$ [mm]	
$V_{R,k}$ [kN] for $t_{N,I}$ [mm]	0.40	0.84*	*Failure of component I **Failure of component II
	0.50	1.72*	
	0.55	1.72*	
	0.60	1.72*	
	0.63	1.90*	
	0.70	1.99*	
	0.75	2.69*	
	0.88	2.69*	
	1.00	3.10*	
$N_{R,k}$ [kN] for $t_{N,I}$ [mm]	0.40	3.63**	
	0.50	3.63**	
	0.55	3.63**	
	0.60	3.63**	
	0.63	3.63**	
	0.70	3.63**	
	0.75	3.63**	
	0.88	3.63**	
	1.00	3.63**	
$N_{R\,II,k}$ [kN]		3.63**	
max. head displacement "u" depending on sandwich panel thickness [mm]	30	0.7	
	40	0.9	
	50	1.2	
	60	1.4	
	70	1.6	
	80	1.8	
	90	2.1	
	100	2.3	
	110	2.5	
	120	2.8	
	130	3.0	
	≥140	3.2	

Fastening screws for sandwich panels

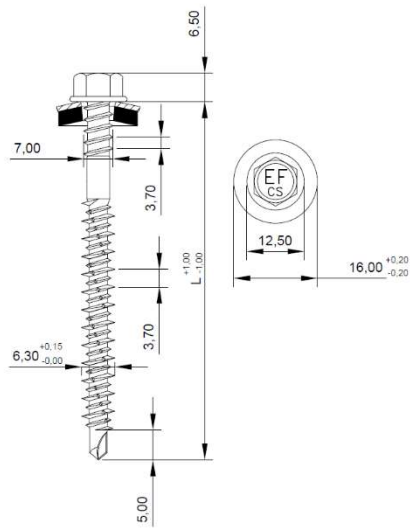
Self-drilling screws ESPS-CS2-Z 7,0/6,3xL with hexagon head, washer Z19, Z22, Z25 or Z29 and saddle washer ESW

Annex 124

of European Technical Assessment ETA-16/0734

Materials

Fastener:	carbon steel – SAE1022, quenched, tempered and coated: galvanized (12 µm)
Washer:	Z16 – carbon steel washer with EPDM ring
Component I:	S280GD, S320GD or S350GD – EN 10346
Component II:	construction wood C24 – EN 14081



Drilling capacity: $\Sigma(t_{N2} + t_{II}) \leq 2 \times 1{,}00$ mm

Timber substructures
For timber structures performance assessed with
$M_{y,Rk}$ = 8,91 Nm
$f_{ax,k}$ = 14,408 N/mm² for $l_{ef} \geq 40$ mm

Component II: wood class ≥C24		$l_{ef} \geq 40$ [mm]	
$V_{R,k}$ [kN] for $t_{N,I}$ [mm]	0.40	0.84*	*Failure of component I **Failure of component II
	0.50	1.72*	
	0.55	1.72*	
	0.60	1.72*	
	0.63	1.90*	
	0.70	1.99*	
	0.75	2.69*	
	0.88	2.69*	
	1.00	3.10*	
$N_{R,k}$ [kN] for $t_{N,I}$ [mm]	0.40	1.40*	
	0.50	2.53*	
	0.55	2.53*	
	0.60	2.77*	
	0.63	2.77*	
	0.70	2.89*	
	0.75	2.89*	
	0.88	2.89*	
	1.00	3.63**	
$N_{R\,II,k}$ [kN]		3.63**	
max. head displacement "u" depending on sandwich panel thickness [mm]	30	0.7	
	40	0.9	
	50	1.2	
	60	1.4	
	70	1.6	
	80	1.8	
	90	2.1	
	100	2.3	
	110	2.5	
	120	2.8	
	130	3.0	
	≥140	3.2	

Fastening screws for sandwich panels

Self-drilling screws ESPS-CS2-Z 7,0/6,3xL with hexagon head and washer Z16

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of European Technical Assessment ETA-16/0734

Materials

Fastener:	carbon steel – SAE1022, quenched, tempered and coated: galvanized (12 µm)
Washer:	Z16 – carbon steel washer with EPDM ring
Linear washer:	ELW-Z made of carbon steel – $R_{0,2}$ ≥ 200 MPa and galvanized min. 200 g/m² ELW-S made of stainless steel A2 – EN ISO 3506
Component I:	S280GD, S320GD or S350GD – EN 10346
Component II:	construction wood C24 – EN 14081

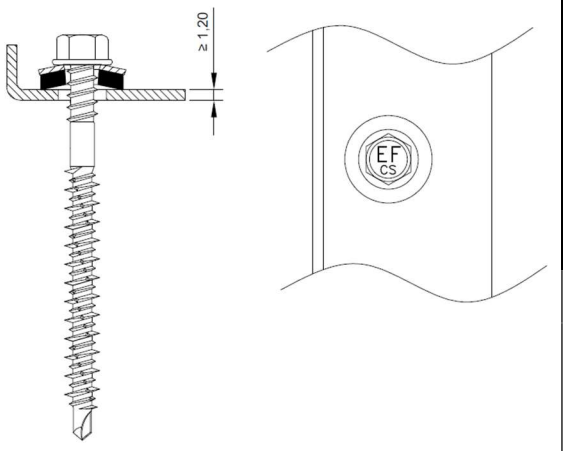
Drilling capacity: $\Sigma(t_{N2} + t_{II}) \leq 2 \times 1{,}00$ mm

Timber substructures

For timber structures performance assessed with

$M_{y,Rk}$ = 8,91 Nm

$f_{ax,k}$ = 14,408 N/mm² for l_{ef} ≥ 40 mm



Component II: wood class ≥C24		l_{ef} ≥ 40 [mm]	
$V_{R,k}$ [kN] for $t_{N,I}$ [mm]	0.40	0.84*	*Failure of component I **Failure of component II
	0.50	1.72*	
	0.55	1.72*	
	0.60	1.72*	
	0.63	1.90*	
	0.70	1.99*	
	0.75	2.69*	
	0.88	2.69*	
	1.00	3.10*	
$N_{R,k}$ [kN] for $t_{N,I}$ [mm]	0.40	3.63**	
	0.50	3.63**	
	0.55	3.63**	
	0.60	3.63**	
	0.63	3.63**	
	0.70	3.63**	
	0.75	3.63**	
	0.88	3.63**	
	1.00	3.63**	
$N_{R\,II,k}$ [kN]		3.63**	
max. head displacement "u" depending on sandwich panel thickness [mm]	30	0.7	
	40	0.9	
	50	1.2	
	60	1.4	
	70	1.6	
	80	1.8	
	90	2.1	
	100	2.3	
	110	2.5	
	120	2.8	
	130	3.0	
	≥140	3.2	

Fastening screws for sandwich panels

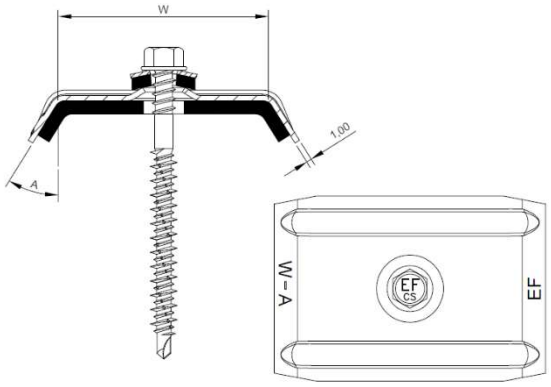
Self-drilling screws ESPS-CS2-Z 7,0/6,3xL with hexagon head, washer Z16 and linear washer ELW-Z or ELW-S

Annex 126

of European Technical Assessment ETA-16/0734

Materials

Fastener:	carbon steel – SAE1022, quenched, tempered and coated: galvanized (12 µm)
Washer:	Z16 – carbon steel washer with EPDM ring
Saddle washer:	ESW made of aluminum
Component I:	S280GD, S320GD or S350GD – EN 10346
Component II:	construction wood C24 – EN 14081



Drilling capacity: $\Sigma(t_{N2} + t_{II}) \leq 2 \times 1{,}00$ mm

Timber substructures
For timber structures performance assessed with
$M_{y,Rk}$ = 8,91 Nm
$f_{ax,k}$ = 14,408 N/mm² for $l_{ef} \geq 40$ mm

Component II: wood class ≥C24		$l_{ef} \geq 40$ [mm]	
$V_{R,k}$ [kN] for $t_{N,I}$ [mm]	0.40	0.84*	*Failure of component I **Failure of component II
	0.50	1.72*	
	0.55	1.72*	
	0.60	1.72*	
	0.63	1.90*	
	0.70	1.99*	
	0.75	2.69*	
	0.88	2.69*	
	1.00	3.10*	
$N_{R,k}$ [kN] for $t_{N,I}$ [mm]	0.40	3.63**	
	0.50	3.63**	
	0.55	3.63**	
	0.60	3.63**	
	0.63	3.63**	
	0.70	3.63**	
	0.75	3.63**	
	0.88	3.63**	
	1.00	3.63**	
$N_{R\ II,k}$ [kN]		3.63**	
max. head displacement "u" depending on sandwich panel thickness [mm]	30	0.7	
	40	0.9	
	50	1.2	
	60	1.4	
	70	1.6	
	80	1.8	
	90	2.1	
	100	2.3	
	110	2.5	
	120	2.8	
	130	3.0	
	≥140	3.2	

Fastening screws for sandwich panels

Self-drilling screws ESPS-CS2-Z 7,0/6,3xL with hexagon head, washer Z16 and saddle washer ESW

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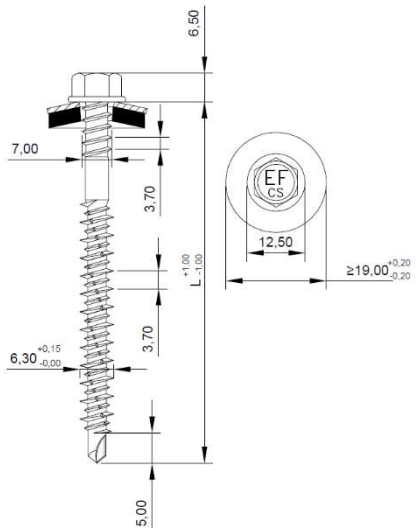
of European Technical Assessment ETA-16/0734

Materials

Fastener:	carbon steel – SAE1022, quenched, tempered and coated: galvanized with PREMIUM coating
Washer:	A19, A22, A25, A29 – aluminum washer with EPDM ring
Component I:	S280GD, S320GD or S350GD – EN 10346
Component II:	construction wood C24 – EN 14081



Drilling capacity: $\Sigma(t_{N2} + t_{II}) \leq 2 \times 1{,}00$ mm

Timber substructures

For timber structures performance assessed with
$M_{y,Rk}$ = 8,91 Nm
$f_{ax,k}$ = 14,408 N/mm² for $l_{ef} \geq 40$ mm

Component II: wood class ≥C24		$l_{ef} \geq 40$ [mm]	
$V_{R,k}$ [kN] for $t_{N,I}$ [mm]	0.40	0.84*	*Failure of component I **Failure of component II
	0.50	1.72*	
	0.55	1.72*	
	0.60	1.72*	
	0.63	1.90*	
	0.70	1.99*	
	0.75	2.69*	
	0.88	2.69*	
	1.00	3.10*	
$N_{R,k}$ [kN] for $t_{N,I}$ [mm]	0.40	1.81*	
	0.50	3.63**	
	0.55	3.63**	
	0.60	3.63**	
	0.63	3.63**	
	0.70	3.63**	
	0.75	3.63**	
	0.88	3.63**	
	1.00	3.63**	
$N_{R\,II,k}$ [kN]		3.63**	
max. head displacement "u" depending on sandwich panel thickness [mm]	30	0.7	
	40	0.9	
	50	1.2	
	60	1.4	
	70	1.6	
	80	1.8	
	90	2.1	
	100	2.3	
	110	2.5	
	120	2.8	
	130	3.0	
	≥140	3.2	

Fastening screws for sandwich panels

Self-drilling screws ESPS-CS2-P 7,0/6,3xL with hexagon head and washer A19, A22, A25 or A29

Annex 128

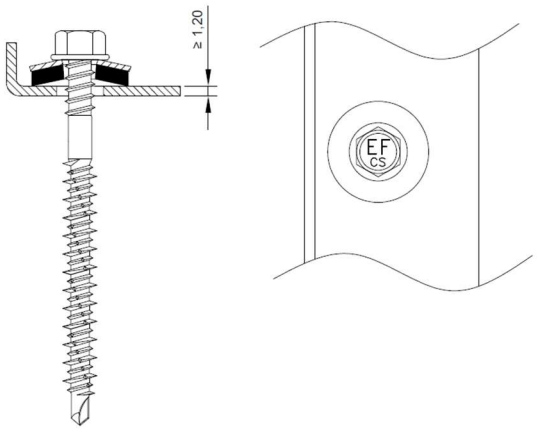
of European Technical Assessment ETA-16/0734

Materials

Fastener:	carbon steel – SAE1022, quenched, tempered and coated: galvanized with PREMIUM coating
Washer:	A19, A22, A25, A29 – aluminum washer with EPDM ring
Linear washer:	ELW-Z made of carbon steel – $R_{0,2}$ ≥ 200 MPa and galvanized min. 200 g/m² ELW-S made of stainless steel A2 – EN ISO 3506
Component I:	S280GD, S320GD or S350GD – EN 10346
Component II:	construction wood C24 – EN 14081

Drilling capacity: $\Sigma(t_{N2} + t_{II}) \leq 2 \times 1{,}00$ mm

Timber substructures
For timber structures performance assessed with
$M_{y,Rk}$ = 8,91 Nm
$f_{ax,k}$ = 14,408 N/mm² for l_{ef} ≥ 40 mm



Component II: wood class ≥C24		l_{ef} ≥ 40 [mm]	
$V_{R,k}$ [kN] for $t_{N,I}$ [mm]	0.40	0.84*	*Failure of component I **Failure of component II
	0.50	1.72*	
	0.55	1.72*	
	0.60	1.72*	
	0.63	1.90*	
	0.70	1.99*	
	0.75	2.69*	
	0.88	2.69*	
	1.00	3.10*	
$N_{R,k}$ [kN] for $t_{N,I}$ [mm]	0.40	3.63**	
	0.50	3.63**	
	0.55	3.63**	
	0.60	3.63**	
	0.63	3.63**	
	0.70	3.63**	
	0.75	3.63**	
	0.88	3.63**	
	1.00	3.63**	
$N_{R\ II,k}$ [kN]		3.63**	
max. head displacement "u" depending on sandwich panel thickness [mm]	30	0.7	
	40	0.9	
	50	1.2	
	60	1.4	
	70	1.6	
	80	1.8	
	90	2.1	
	100	2.3	
	110	2.5	
	120	2.8	
	130	3.0	
	≥140	3.2	

Fastening screws for sandwich panels

Self-drilling screws ESPS-CS2-P 7,0/6,3xL with hexagon head, washer A19, A22, A25 or A29 and linear washer ELW-Z or ELW-S

Annex 129

of European Technical Assessment ETA-16/0734

Materials

Fastener:	carbon steel – SAE1022, quenched, tempered and coated: galvanized with PREMIUM coating
Washer:	A19, A22, A25, A29 – aluminum washer with EPDM ring
Saddle washer:	ESW made of aluminum
Component I:	S280GD, S320GD or S350GD – EN 10346
Component II:	construction wood C24 – EN 14081

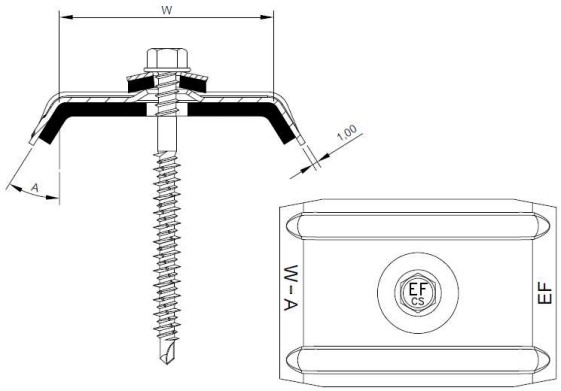
Drilling capacity: $\Sigma(t_{N2} + t_{II}) \leq 2 \times 1{,}00$ mm

Timber substructures

For timber structures performance assessed with

$M_{y,Rk}$ = 8,91 Nm

$f_{ax,k}$ = 14,408 N/mm² for $l_{ef} \geq 40$ mm



Component II: wood class ≥C24		$l_{ef} \geq 40$ [mm]	
$V_{R,k}$ [kN] for $t_{N,I}$ [mm]	0.40	0.84*	*Failure of component I **Failure of component II
	0.50	1.72*	
	0.55	1.72*	
	0.60	1.72*	
	0.63	1.90*	
	0.70	1.99*	
	0.75	2.69*	
	0.88	2.69*	
	1.00	3.10*	
$N_{R,k}$ [kN] for $t_{N,I}$ [mm]	0.40	3.63**	
	0.50	3.63**	
	0.55	3.63**	
	0.60	3.63**	
	0.63	3.63**	
	0.70	3.63**	
	0.75	3.63**	
	0.88	3.63**	
	1.00	3.63**	
$N_{R\ II,k}$ [kN]		3.63**	
max. head displacement "u" depending on sandwich panel thickness [mm]	30	0.7	
	40	0.9	
	50	1.2	
	60	1.4	
	70	1.6	
	80	1.8	
	90	2.1	
	100	2.3	
	110	2.5	
	120	2.8	
	130	3.0	
	≥140	3.2	

Fastening screws for sandwich panels

Self-drilling screws ESPS-CS2-P 7,0/6,3xL with hexagon head, washer A19, A22, A25 or A29 and saddle washer ESW

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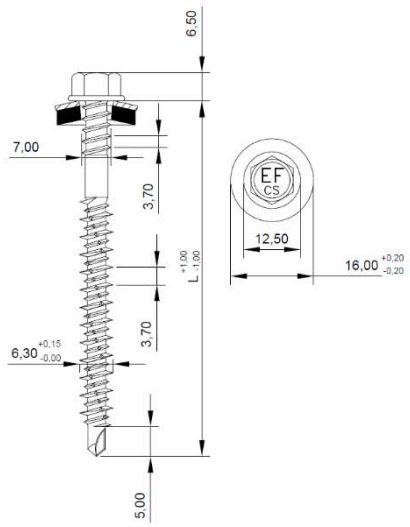
of European Technical Assessment ETA-16/0734

Materials

Fastener:	carbon steel – SAE1022, quenched, tempered and coated: galvanized with PREMIUM coating
Washer:	A16 – aluminum washer with EPDM ring
Component I:	S280GD, S320GD or S350GD – EN 10346
Component II:	construction wood C24 – EN 14081



Drilling capacity: $\Sigma(t_{N2} + t_{II}) \leq 2 \times 1{,}00$ mm

Timber substructures
For timber structures performance assessed with
$M_{y,Rk}$ = 8,91 Nm
$f_{ax,k}$ = 14,408 N/mm² for $l_{ef} \geq 40$ mm

Component II: wood class ≥C24		$l_{ef} \geq 40$ [mm]	
$V_{R,k}$ [kN] for $t_{N,I}$ [mm]	0.40	0.84*	*Failure of component I **Failure of component II
	0.50	1.72*	
	0.55	1.72*	
	0.60	1.72*	
	0.63	1.90*	
	0.70	1.99*	
	0.75	2.69*	
	0.88	2.69*	
	1.00	3.10*	
$N_{R,k}$ [kN] for $t_{N,I}$ [mm]	0.40	1.40*	
	0.50	2.53*	
	0.55	2.53*	
	0.60	2.77*	
	0.63	2.77*	
	0.70	2.89*	
	0.75	2.89*	
	0.88	2.89*	
	1.00	3.63**	
$N_{R\,II,k}$ [kN]		3.63**	
max. head displacement "u" depending on sandwich panel thickness [mm]	30	0.7	
	40	0.9	
	50	1.2	
	60	1.4	
	70	1.6	
	80	1.8	
	90	2.1	
	100	2.3	
	110	2.5	
	120	2.8	
	130	3.0	
	≥140	3.2	

Fastening screws for sandwich panels

Self-drilling screws ESPS-CS2-P 7,0/6,3xL with hexagon head and washer A16

Annex 131

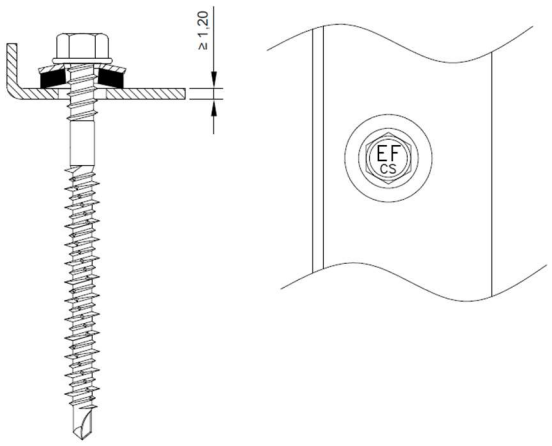
of European Technical Assessment ETA-16/0734

Materials

Fastener:	carbon steel – SAE1022, quenched, tempered and coated: galvanized with PREMIUM coating
Washer:	A16 – aluminum washer with EPDM ring
Linear washer:	ELW-Z made of carbon steel – $R_{0,2} \geq 200$ MPa and galvanized min. 200 g/m² ELW-S made of stainless steel A2 – EN ISO 3506
Component I:	S280GD, S320GD or S350GD – EN 10346
Component II:	construction wood C24 – EN 14081

Drilling capacity: $\Sigma(t_{N2} + t_{II}) \leq 2 \times 1{,}00$ mm

Timber substructures
For timber structures performance assessed with
$M_{y,Rk}$ = 8,91 Nm
$f_{ax,k}$ = 14,408 N/mm² for $l_{ef} \geq 40$ mm



Component II: wood class ≥C24		$l_{ef} \geq 40$ [mm]	
$V_{R,k}$ [kN] for $t_{N,I}$ [mm]	0.40	0.84*	*Failure of component I **Failure of component II
	0.50	1.72*	
	0.55	1.72*	
	0.60	1.72*	
	0.63	1.90*	
	0.70	1.99*	
	0.75	2.69*	
	0.88	2.69*	
	1.00	3.10*	
$N_{R,k}$ [kN] for $t_{N,I}$ [mm]	0.40	3.63**	
	0.50	3.63**	
	0.55	3.63**	
	0.60	3.63**	
	0.63	3.63**	
	0.70	3.63**	
	0.75	3.63**	
	0.88	3.63**	
	1.00	3.63**	
$N_{R\ II,k}$ [kN]		3.63**	
max. head displacement "u" depending on sandwich panel thickness [mm]	30	0.7	
	40	0.9	
	50	1.2	
	60	1.4	
	70	1.6	
	80	1.8	
	90	2.1	
	100	2.3	
	110	2.5	
	120	2.8	
	130	3.0	
	≥140	3.2	

Fastening screws for sandwich panels

Self-drilling screws ESPS-CS2-P 7,0/6,3xL with hexagon head, washer A16 and linear washer ELW-Z or ELW-S

Annex 132

of European Technical Assessment ETA-16/0734

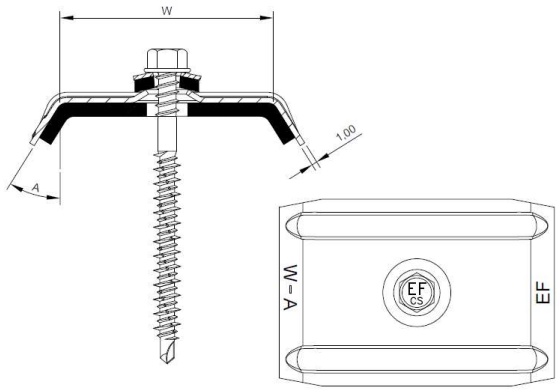
Materials

Fastener:	carbon steel – SAE1022, quenched, tempered and coated: galvanized with PREMIUM coating
Washer:	A16 – aluminum washer with EPDM ring
Saddle washer:	ESW made of aluminum
Component I:	S280GD, S320GD or S350GD – EN 10346
Component II:	construction wood C24 – EN 14081

Drilling capacity: $\Sigma(t_{N2} + t_{II}) \leq 2 \times 1{,}00$ mm

Timber substructures

For timber structures performance assessed with
$M_{y,Rk}$ = 8,91 Nm
$f_{ax,k}$ = 14,408 N/mm² for $l_{ef} \geq 40$ mm



Component II: wood class ≥C24		$l_{ef} \geq 40$ [mm]	
$V_{R,k}$ [kN] for $t_{N,I}$ [mm]	0.40	0.84*	*Failure of component I **Failure of component II
	0.50	1.72*	
	0.55	1.72*	
	0.60	1.72*	
	0.63	1.90*	
	0.70	1.99*	
	0.75	2.69*	
	0.88	2.69*	
	1.00	3.10*	
$N_{R,k}$ [kN] for $t_{N,I}$ [mm]	0.40	3.63**	
	0.50	3.63**	
	0.55	3.63**	
	0.60	3.63**	
	0.63	3.63**	
	0.70	3.63**	
	0.75	3.63**	
	0.88	3.63**	
	1.00	3.63**	
$N_{R\ II,k}$ [kN]		3.63**	
max. head displacement "u" depending on sandwich panel thickness [mm]	30	0.7	
	40	0.9	
	50	1.2	
	60	1.4	
	70	1.6	
	80	1.8	
	90	2.1	
	100	2.3	
	110	2.5	
	120	2.8	
	130	3.0	
	≥140	3.2	

Fastening screws for sandwich panels

Self-drilling screws ESPS-CS2-P 7,0/6,3xL with hexagon head, washer A16 and saddle washer ESW

Annex 133

of European Technical Assessment ETA-16/0734

Materials

Fastener:	carbon steel – SAE1022, quenched, tempered and coated: galvanized with SUPER PREMIUM coating
Washer:	S19, S22, S25, S29 – stainless steel washer with EPDM ring or A19, A22, A25, A29 – aluminum washer with EPDM ring
Component I:	S280GD, S320GD or S350GD – EN 10346
Component II:	construction wood C24 – EN 14081

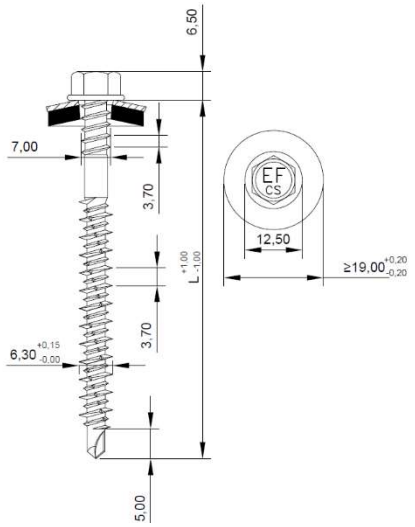
Drilling capacity: $\Sigma(t_{N2} + t_{II}) \leq 2 \times 1{,}00$ mm

Timber substructures

For timber structures performance assessed with

$M_{y,Rk} = 8{,}91$ Nm

$f_{ax,k} = 14{,}408$ N/mm² for $l_{ef} \geq 40$ mm



Component II: wood class ≥C24		$l_{ef} \geq 40$ [mm]	
$V_{R,k}$ [kN] for $t_{N,I}$ [mm]	0.40	0.84*	*Failure of component I **Failure of component II
	0.50	1.72*	
	0.55	1.72*	
	0.60	1.72*	
	0.63	1.90*	
	0.70	1.99*	
	0.75	2.69*	
	0.88	2.69*	
	1.00	3.10*	
$N_{R,k}$ [kN] for $t_{N,I}$ [mm]	0.40	1.81*	
	0.50	3.63**	
	0.55	3.63**	
	0.60	3.63**	
	0.63	3.63**	
	0.70	3.63**	
	0.75	3.63**	
	0.88	3.63**	
	1.00	3.63**	
$N_{R\,II,k}$ [kN]		3.63**	
max. head displacement "u" depending on sandwich panel thickness [mm]	30	0.7	
	40	0.9	
	50	1.2	
	60	1.4	
	70	1.6	
	80	1.8	
	90	2.1	
	100	2.3	
	110	2.5	
	120	2.8	
	130	3.0	
	≥140	3.2	

Fastening screws for sandwich panels

Self-drilling screws ESPS-CS2-SP 7,0/6,3xL with hexagon head and washer S19, S22, S25, S29, A19, A22, A25 or A29

Annex 134

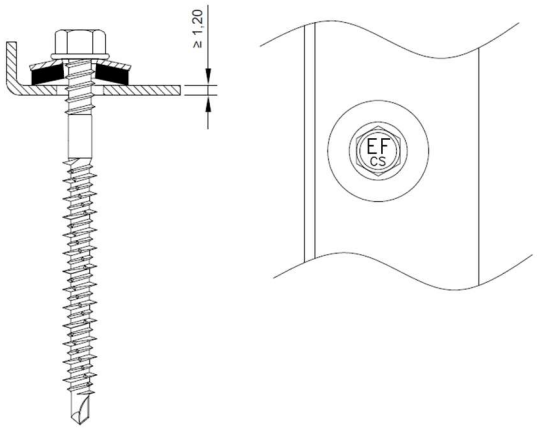
of European Technical Assessment ETA-16/0734

Materials

Fastener:	carbon steel – SAE1022, quenched, tempered and coated: galvanized with SUPER PREMIUM coating
Washer:	S19, S22, S25, S29 – stainless steel washer with EPDM ring or A19, A22, A25, A29 – aluminum washer with EPDM ring
Linear washer:	ELW-Z made of carbon steel – $R_{0,2} \geq 200$ MPa and galvanized min. 200 g/m^2 ELW-S made of stainless steel A2 – EN ISO 3506
Component I:	S280GD, S320GD or S350GD – EN 10346
Component II:	construction wood C24 – EN 14081

Drilling capacity: $\Sigma(t_{N2} + t_{II}) \leq 2 \times 1{,}00$ mm

Timber substructures
For timber structures performance assessed with
$M_{y,Rk}$ = 8,91 Nm
$f_{ax,k}$ = 14,408 N/mm^2 for $l_{ef} \geq 40$ mm



Component II: wood class ≥C24		$l_{ef} \geq 40$ [mm]	
$V_{R,k}$ [kN] for $t_{N,I}$ [mm]	0.40	0.84*	*Failure of component I **Failure of component II
	0.50	1.72*	
	0.55	1.72*	
	0.60	1.72*	
	0.63	1.90*	
	0.70	1.99*	
	0.75	2.69*	
	0.88	2.69*	
	1.00	3.10*	
$N_{R,k}$ [kN] for $t_{N,I}$ [mm]	0.40	3.63**	
	0.50	3.63**	
	0.55	3.63**	
	0.60	3.63**	
	0.63	3.63**	
	0.70	3.63**	
	0.75	3.63**	
	0.88	3.63**	
	1.00	3.63**	
$N_{R\ II,k}$ [kN]		3.63**	
max. head displacement "u" depending on sandwich panel thickness [mm]	30	0.7	
	40	0.9	
	50	1.2	
	60	1.4	
	70	1.6	
	80	1.8	
	90	2.1	
	100	2.3	
	110	2.5	
	120	2.8	
	130	3.0	
	≥140	3.2	

Fastening screws for sandwich panels

Self-drilling screws ESPS-CS2-SP 7,0/6,3xL with hexagon head, washer S19, S22, S25, S29, A19, A22, A25 or A29 and linear washer ELW-Z or ELW-S

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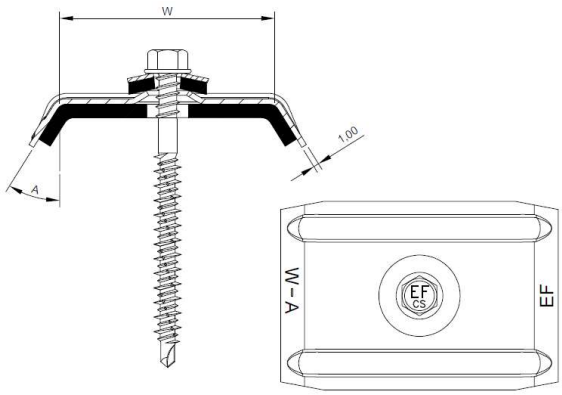
Materials

Fastener:	carbon steel – SAE1022, quenched, tempered and coated: galvanized with SUPER PREMIUM coating
Washer:	S19, S22, S25, S29 – stainless steel washer with EPDM ring or A19, A22, A25, A29 – aluminum washer with EPDM ring
Saddle washer:	ESW made of aluminum
Component I:	S280GD, S320GD or S350GD – EN 10346
Component II:	construction wood C24 – EN 14081

Drilling capacity: $\Sigma(t_{N2} + t_{II}) \leq 2 \times 1{,}00$ mm

Timber substructures
For timber structures performance assessed with
$M_{y,Rk}$ = 8,91 Nm
$f_{ax,k}$ = 14,408 N/mm² for $l_{ef} \geq 40$ mm



Component II: wood class ≥C24		$l_{ef} \geq 40$ [mm]	
$V_{R,k}$ [kN] for $t_{N,I}$ [mm]	0.40	0.84*	*Failure of component I **Failure of component II
	0.50	1.72*	
	0.55	1.72*	
	0.60	1.72*	
	0.63	1.90*	
	0.70	1.99*	
	0.75	2.69*	
	0.88	2.69*	
	1.00	3.10*	
$N_{R,k}$ [kN] for $t_{N,I}$ [mm]	0.40	3.63**	
	0.50	3.63**	
	0.55	3.63**	
	0.60	3.63**	
	0.63	3.63**	
	0.70	3.63**	
	0.75	3.63**	
	0.88	3.63**	
	1.00	3.63**	
$N_{R\,II,k}$ [kN]		3.63**	
max. head displacement "u" depending on sandwich panel thickness [mm]	30	0.7	
	40	0.9	
	50	1.2	
	60	1.4	
	70	1.6	
	80	1.8	
	90	2.1	
	100	2.3	
	110	2.5	
	120	2.8	
	130	3.0	
	≥140	3.2	

Fastening screws for sandwich panels

Self-drilling screws ESPS-CS2-SP 7,0/6,3xL with hexagon head, washer S19, S22, S25, S29, A19, A22, A25 or A29 and saddle washer ESW

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Materials

Fastener:	carbon steel – SAE1022, quenched, tempered and coated: galvanized with SUPER PREMIUM coating
Washer:	S16 – stainless steel washer with EPDM ring or A16 – aluminum washer with EPDM ring
Component I:	S280GD, S320GD or S350GD – EN 10346
Component II:	construction wood C24 – EN 14081

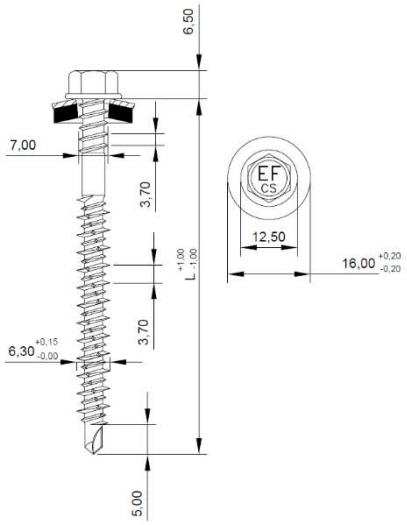
Drilling capacity: $\Sigma(t_{N2} + t_{II}) \leq 2 \times 1{,}00$ mm

Timber substructures

For timber structures performance assessed with

$M_{y,Rk}$ = 8,91 Nm

$f_{ax,k}$ = 14,408 N/mm² for $l_{ef} \geq 40$ mm



Component II: wood class ≥C24		$l_{ef} \geq 40$ [mm]	
$V_{R,k}$ [kN] for $t_{N,I}$ [mm]	0.40	0.84*	*Failure of component I **Failure of component II
	0.50	1.72*	
	0.55	1.72*	
	0.60	1.72*	
	0.63	1.90*	
	0.70	1.99*	
	0.75	2.69*	
	0.88	2.69*	
	1.00	3.10*	
$N_{R,k}$ [kN] for $t_{N,I}$ [mm]	0.40	1.40*	
	0.50	2.53*	
	0.55	2.53*	
	0.60	2.77*	
	0.63	2.77*	
	0.70	2.89*	
	0.75	2.89*	
	0.88	2.89*	
	1.00	3.63**	
$N_{R\,II,k}$ [kN]		3.63**	
max. head displacement "u" depending on sandwich panel thickness [mm]	30	0.7	
	40	0.9	
	50	1.2	
	60	1.4	
	70	1.6	
	80	1.8	
	90	2.1	
	100	2.3	
	110	2.5	
	120	2.8	
	130	3.0	
	≥140	3.2	

Fastening screws for sandwich panels

Self-drilling screws ESPS-CS2-SP 6,3/5,5xL with hexagon head and washer S16 or A16

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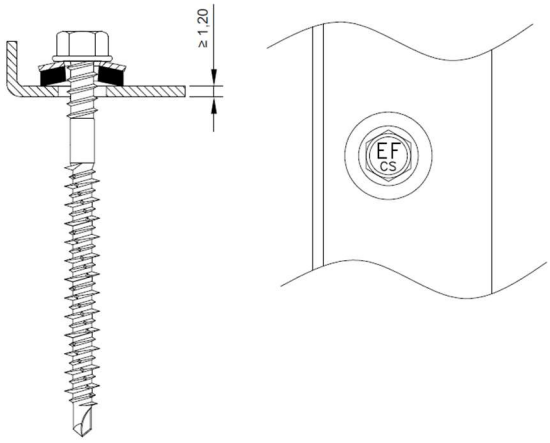
Materials

Fastener:	carbon steel – SAE1022, quenched, tempered and coated: galvanized with SUPER PREMIUM coating
Washer:	S16 – stainless steel washer with EPDM ring or A16 – aluminum washer with EPDM ring
Linear washer:	ELW-Z made of carbon steel – $R_{0,2}$ ≥ 200 MPa and galvanized min. 200 g/m² ELW-S made of stainless steel A2 – EN ISO 3506
Component I:	S280GD, S320GD or S350GD – EN 10346
Component II:	construction wood C24 – EN 14081

Drilling capacity: $\Sigma(t_{N2} + t_{II}) \leq 2 \times 1{,}00$ mm

Timber substructures

For timber structures performance assessed with
$M_{y,Rk}$ = 8,91 Nm
$f_{ax,k}$ = 14,408 N/mm² for l_{ef} ≥ 40 mm



Component II: wood class ≥C24		l_{ef} ≥ 40 [mm]	
$V_{R,k}$ [kN] for $t_{N,I}$ [mm]	0.40	0.84*	*Failure of component I **Failure of component II
	0.50	1.72*	
	0.55	1.72*	
	0.60	1.72*	
	0.63	1.90*	
	0.70	1.99*	
	0.75	2.69*	
	0.88	2.69*	
	1.00	3.10*	
$N_{R,k}$ [kN] for $t_{N,I}$ [mm]	0.40	3.63**	
	0.50	3.63**	
	0.55	3.63**	
	0.60	3.63**	
	0.63	3.63**	
	0.70	3.63**	
	0.75	3.63**	
	0.88	3.63**	
	1.00	3.63**	
$N_{R\ II,k}$ [kN]		3.63**	
max. head displacement "u" depending on sandwich panel thickness [mm]	30	0.7	
	40	0.9	
	50	1.2	
	60	1.4	
	70	1.6	
	80	1.8	
	90	2.1	
	100	2.3	
	110	2.5	
	120	2.8	
	130	3.0	
	≥140	3.2	

Fastening screws for sandwich panels

Self-drilling screws ESPS-CS2-SP 7,0/6,3xL with hexagon head, washer S16 or A16 and linear washer ELW-Z or ELW-S

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of European Technical Assessment ETA-16/0734

Materials

Fastener:	carbon steel – SAE1022, quenched, tempered and coated: galvanized with SUPER PREMIUM coating
Washer:	S16 – stainless steel washer with EPDM ring or A16 – aluminum washer with EPDM ring
Saddle washer:	ESW made of aluminum
Component I:	S280GD, S320GD or S350GD – EN 10346
Component II:	construction wood C24 – EN 14081

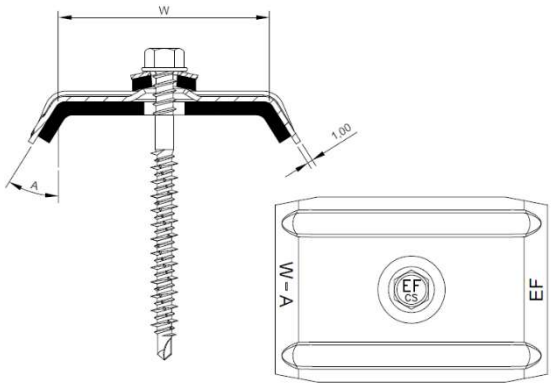
Drilling capacity: $\Sigma(t_{N2} + t_{II}) \leq 2 \times 1{,}00$ mm

Timber substructures

For timber structures performance assessed with

$M_{y,Rk}$ = 8,91 Nm

$f_{ax,k}$ = 14,408 N/mm² for $l_{ef} \geq 40$ mm



Component II: wood class ≥C24		$l_{ef} \geq 40$ [mm]	
$V_{R,k}$ [kN] for $t_{N,I}$ [mm]	0.40	0.84*	*Failure of component I **Failure of component II
	0.50	1.72*	
	0.55	1.72*	
	0.60	1.72*	
	0.63	1.90*	
	0.70	1.99*	
	0.75	2.69*	
	0.88	2.69*	
	1.00	3.10*	
$N_{R,k}$ [kN] for $t_{N,I}$ [mm]	0.40	3.63**	
	0.50	3.63**	
	0.55	3.63**	
	0.60	3.63**	
	0.63	3.63**	
	0.70	3.63**	
	0.75	3.63**	
	0.88	3.63**	
	1.00	3.63**	
$N_{R\ II,k}$ [kN]		3.63**	
max. head displacement "u" depending on sandwich panel thickness [mm]	30	0.7	
	40	0.9	
	50	1.2	
	60	1.4	
	70	1.6	
	80	1.8	
	90	2.1	
	100	2.3	
	110	2.5	
	120	2.8	
	130	3.0	
	≥140	3.2	

Fastening screws for sandwich panels

Self-drilling screws ESPS-CS2-SP 7,0/6,3xL with hexagon head, washer S16 or A16 and saddle washer ESW

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of European Technical Assessment ETA-16/0734

Materials

Fastener:	carbon steel – SAE1022, quenched, tempered and coated: galvanized (12 µm)
Washer:	Z19, Z22, Z25, Z29 – carbon steel washer with EPDM ring
Component I:	S280GD, S320GD or S350GD – EN 10346
Component II:	construction wood C24 – EN 14081

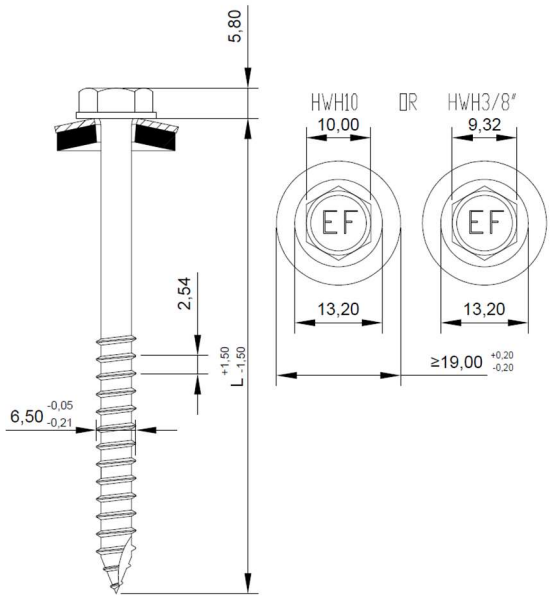
Drilling capacity: -

Timber substructures

For timber structures performance assessed with

$M_{y,Rk}$ = 9,66 Nm

$f_{ax,k}$ = 14,538 N/mm² for l_{ef} ≥ 40 mm



Component II: wood class ≥C24		l_{ef} ≥ 40 [mm]	
$V_{R,k}$ [kN] for $t_{N,I}$ [mm]	0.40	1.60*	*Failure of component I **Failure of component II
	0.50	2.52*	
	0.55	2.52*	
	0.60	3.16*	
	0.63	3.16*	
	0.70	3.16*	
	0.75	3.16*	
	0.88	3.16*	
	1.00	3.16*	
$N_{R,k}$ [kN] for $t_{N,I}$ [mm]	0.40	1.81*	
	0.50	3.78**	
	0.55	3.78**	
	0.60	3.78**	
	0.63	3.78**	
	0.70	3.78**	
	0.75	3.78**	
	0.88	3.78**	
	1.00	3.78**	
$N_{R\ II,k}$ [kN]		3.78**	
max. head displacement "u" depending on sandwich panel thickness [mm]	30	0.7	
	40	0.9	
	50	1.2	
	60	1.4	
	70	1.6	
	80	1.8	
	90	2.1	
	100	2.3	
	110	2.5	
	120	2.8	
	130	3.0	
	≥140	3.2	

Fastening screws for sandwich panels

Self-tapping screws ESTS-0A-Z 6,5xL / ESTS-HWH10-0A-Z 6,5xL with hexagon head and washer Z19, Z22, Z25 or Z29

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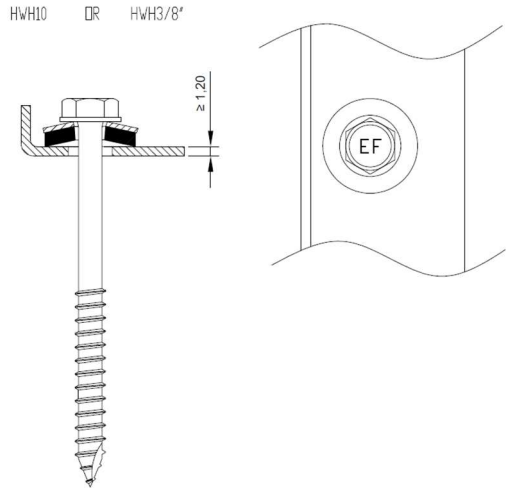
Materials

Fastener:	carbon steel – SAE1022, quenched, tempered and coated: galvanized (12 µm)
Washer:	Z19, Z22, Z25, Z29 – carbon steel washer with EPDM ring
Linear washer:	ELW-Z made of carbon steel – $R_{0,2} \geq 200$ MPa and galvanized min. 200 g/m² ELW-S made of stainless steel A2 – EN ISO 3506
Component I:	S280GD, S320GD or S350GD – EN 10346
Component II:	construction wood C24 – EN 14081

Drilling capacity: -

Timber substructures
For timber structures performance assessed with
$M_{y,Rk}$ = 9,66 Nm
$f_{ax,k}$ = 14,538 N/mm² for $l_{ef} \geq 40$ mm



Component II: wood class ≥C24		$l_{ef} \geq 40$ [mm]	
$V_{R,k}$ [kN] for $t_{N,I}$ [mm]	0.40	1.60*	*Failure of component I **Failure of component II
	0.50	2.52*	
	0.55	2.52*	
	0.60	3.16*	
	0.63	3.16*	
	0.70	3.16*	
	0.75	3.16*	
	0.88	3.16*	
	1.00	3.16*	
$N_{R,k}$ [kN] for $t_{N,I}$ [mm]	0.40	3.78**	
	0.50	3.78**	
	0.55	3.78**	
	0.60	3.78**	
	0.63	3.78**	
	0.70	3.78**	
	0.75	3.78**	
	0.88	3.78**	
	1.00	3.78**	
$N_{R\ II,k}$ [kN]		3.78**	
max. head displacement "u" depending on sandwich panel thickness [mm]	30	0.7	
	40	0.9	
	50	1.2	
	60	1.4	
	70	1.6	
	80	1.8	
	90	2.1	
	100	2.3	
	110	2.5	
	120	2.8	
	130	3.0	
	≥140	3.2	

Fastening screws for sandwich panels

Self-tapping screws ESTS-0A-Z 6,5xL / ESTS-HWH10-0A-Z 6,5xL
with hexagon head, washer Z19, Z22, Z25 or Z29
and linear washer ELW-Z or ELW-S

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of European
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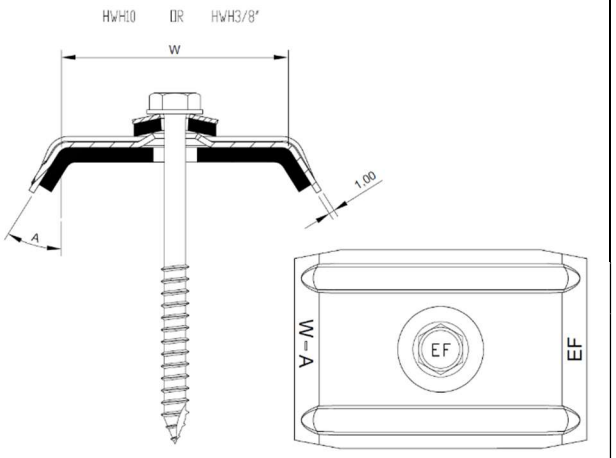
Materials

Fastener:	carbon steel – SAE1022, quenched, tempered and coated: galvanized (12 µm)
Washer:	Z19, Z22, Z25, Z29 – carbon steel washer with EPDM ring
Saddle washer:	ESW made of aluminum
Component I:	S280GD, S320GD or S350GD – EN 10346
Component II:	construction wood C24 – EN 14081

Drilling capacity: -

Timber substructures

For timber structures performance assessed with
$M_{y,Rk}$ = 9,66 Nm
$f_{ax,k}$ = 14,538 N/mm² for l_{ef} ≥ 40 mm



Component II: wood class ≥C24		l_{ef} ≥ 40 [mm]	
$V_{R,k}$ [kN] for $t_{N,I}$ [mm]	0.40	1.60*	*Failure of component I **Failure of component II
	0.50	2.52*	
	0.55	2.52*	
	0.60	3.16*	
	0.63	3.16*	
	0.70	3.16*	
	0.75	3.16*	
	0.88	3.16*	
	1.00	3.16*	
$N_{R,k}$ [kN] for $t_{N,I}$ [mm]	0.40	3.78**	
	0.50	3.78**	
	0.55	3.78**	
	0.60	3.78**	
	0.63	3.78**	
	0.70	3.78**	
	0.75	3.78**	
	0.88	3.78**	
	1.00	3.78**	
$N_{R\ II,k}$ [kN]		3.78**	
max. head displacement "u" depending on sandwich panel thickness [mm]	30	0.7	
	40	0.9	
	50	1.2	
	60	1.4	
	70	1.6	
	80	1.8	
	90	2.1	
	100	2.3	
	110	2.5	
	120	2.8	
	130	3.0	
	≥140	3.2	

Fastening screws for sandwich panels

Self-tapping screws ESTS-0A-Z 6,5xL / ESTS-HWH10-0A-Z 6,5xL
with hexagon head, washer Z19, Z22, Z25 or Z29
and saddle washer ESW

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of European
Technical Assessment
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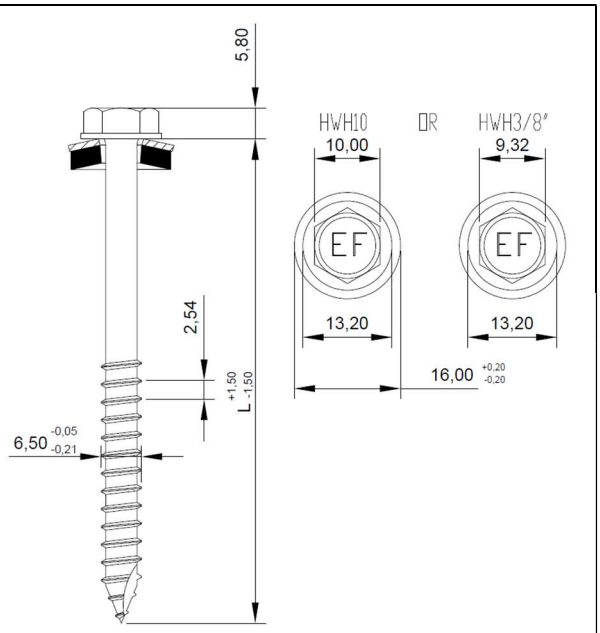
Materials

Fastener:	carbon steel – SAE1022, quenched, tempered and coated: galvanized (12 µm)
Washer:	Z16 – carbon steel washer with EPDM ring
Component I:	S280GD, S320GD or S350GD – EN 10346
Component II:	construction wood C24 – EN 14081

Drilling capacity: -

Timber substructures

For timber structures performance assessed with
$M_{y,Rk}$ = 9,66 Nm
$f_{ax,k}$ = 14,538 N/mm² for l_{ef} ≥ 40 mm



Component II: wood class ≥C24		l_{ef} ≥ 40 [mm]	
$V_{R,k}$ [kN] for $t_{N,I}$ [mm]	0.40	1.60*	*Failure of component I **Failure of component II
	0.50	2.52*	
	0.55	2.52*	
	0.60	3.16*	
	0.63	3.16*	
	0.70	3.16*	
	0.75	3.16*	
	0.88	3.16*	
	1.00	3.16*	
$N_{R,k}$ [kN] for $t_{N,I}$ [mm]	0.40	1.40*	
	0.50	2.53*	
	0.55	2.53*	
	0.60	2.77*	
	0.63	2.77*	
	0.70	2.89*	
	0.75	2.89*	
	0.88	2.89*	
	1.00	3.78**	
$N_{R\ II,k}$ [kN]		3.78**	
max. head displacement "u" depending on sandwich panel thickness [mm]	30	0.7	
	40	0.9	
	50	1.2	
	60	1.4	
	70	1.6	
	80	1.8	
	90	2.1	
	100	2.3	
	110	2.5	
	120	2.8	
	130	3.0	
	≥140	3.2	

Fastening screws for sandwich panels

Self-tapping screws ESTS-0A-Z 6,5xL / ESTS-HWH10-0A-Z 6,5xL with hexagon head and washer Z16

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Materials

Fastener:	carbon steel – SAE1022, quenched, tempered and coated: galvanized (12 µm)
Washer:	Z16 – carbon steel washer with EPDM ring
Linear washer:	ELW-Z made of carbon steel – $R_{0,2}$ ≥ 200 MPa and galvanized min. 200 g/m² ELW-S made of stainless steel A2 – EN ISO 3506
Component I:	S280GD, S320GD or S350GD – EN 10346
Component II:	construction wood C24 – EN 14081

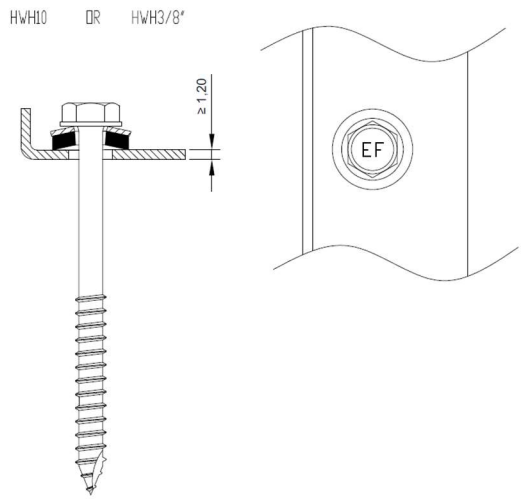
Drilling capacity: -

Timber substructures

For timber structures performance assessed with

$M_{y,Rk}$ = 9,66 Nm

$f_{ax,k}$ = 14,538 N/mm² for l_{ef} ≥ 40 mm



Component II: wood class ≥C24		l_{ef} ≥ 40 [mm]	
$V_{R,k}$ [kN] for $t_{N,I}$ [mm]	0.40	1.60*	*Failure of component I **Failure of component II
	0.50	2.52*	
	0.55	2.52*	
	0.60	3.16*	
	0.63	3.16*	
	0.70	3.16*	
	0.75	3.16*	
	0.88	3.16*	
	1.00	3.16*	
$N_{R,k}$ [kN] for $t_{N,I}$ [mm]	0.40	3.78**	
	0.50	3.78**	
	0.55	3.78**	
	0.60	3.78**	
	0.63	3.78**	
	0.70	3.78**	
	0.75	3.78**	
	0.88	3.78**	
	1.00	3.78**	
$N_{R\ II,k}$ [kN]		3.78**	
max. head displacement "u" depending on sandwich panel thickness [mm]	30	0.7	
	40	0.9	
	50	1.2	
	60	1.4	
	70	1.6	
	80	1.8	
	90	2.1	
	100	2.3	
	110	2.5	
	120	2.8	
	130	3.0	
	≥140	3.2	

Fastening screws for sandwich panels

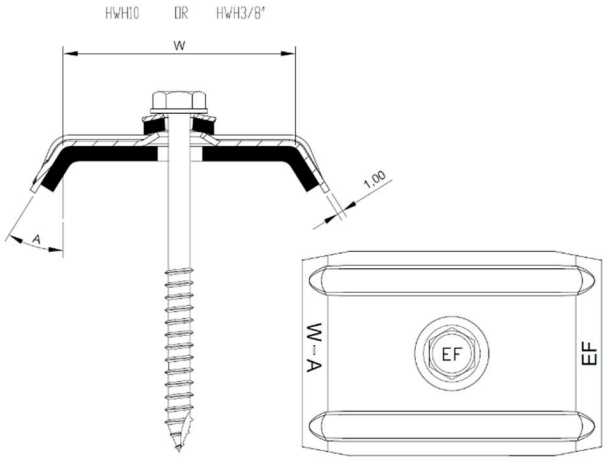
Self-tapping screws ESTS-0A-Z 6,5xL / ESTS-HWH10-0A-Z 6,5xL with hexagon head, washer Z16 and linear washer ELW-Z or ELW-S

Annex 144

of European Technical Assessment ETA-16/0734

Materials

Fastener:	carbon steel – SAE1022, quenched, tempered and coated: galvanized (12 µm)
Washer:	Z16 – carbon steel washer with EPDM ring
Saddle washer:	ESW made of aluminum
Component I:	S280GD, S320GD or S350GD – EN 10346
Component II:	construction wood C24 – EN 14081



Drilling capacity: -

Timber substructures

For timber structures performance assessed with
$M_{y,Rk}$ = 9,66 Nm
$f_{ax,k}$ = 14,538 N/mm² for l_{ef} ≥ 40 mm

Component II: wood class ≥C24		l_{ef} ≥ 40 [mm]	
$V_{R,k}$ [kN] for $t_{N,I}$ [mm]	0.40	1.60*	*Failure of component I **Failure of component II
	0.50	2.52*	
	0.55	2.52*	
	0.60	3.16*	
	0.63	3.16*	
	0.70	3.16*	
	0.75	3.16*	
	0.88	3.16*	
	1.00	3.16*	
$N_{R,k}$ [kN] for $t_{N,I}$ [mm]	0.40	3.78**	
	0.50	3.78**	
	0.55	3.78**	
	0.60	3.78**	
	0.63	3.78**	
	0.70	3.78**	
	0.75	3.78**	
	0.88	3.78**	
	1.00	3.78**	
$N_{R\ II,k}$ [kN]		3.78**	
max. head displacement "u" depending on sandwich panel thickness [mm]	30	0.7	
	40	0.9	
	50	1.2	
	60	1.4	
	70	1.6	
	80	1.8	
	90	2.1	
	100	2.3	
	110	2.5	
	120	2.8	
	130	3.0	
	≥140	3.2	

Fastening screws for sandwich panels

Self-tapping screws ESTS-0A-Z 6,5xL / ESTS-HWH10-0A-Z 6,5xL with hexagon head, washer Z16 and saddle washer ESW

Annex 145

of European Technical Assessment ETA-16/0734

Materials

Fastener:	galvanized stainless steel
Washer:	S19, S22, S25, S29 – stainless steel washer with EPDM ring
Component I:	S280GD, S320GD or S350GD – EN 10346
Component II:	construction wood C24 – EN 14081

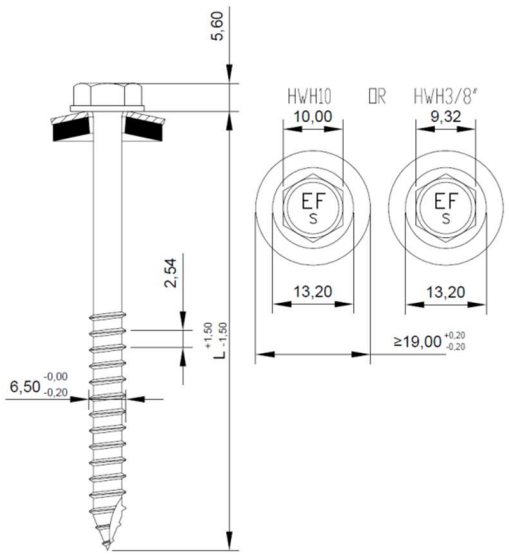
Drilling capacity: -

Timber substructures

For timber structures performance assessed with

$M_{y,Rk}$ = 9,66 Nm

$f_{ax,k}$ = 14,538 N/mm² for l_{ef} ≥ 40 mm



Component II: wood class ≥C24		l_{ef} ≥ 40 [mm]	
$V_{R,k}$ [kN] for $t_{N,I}$ [mm]	0.40	1.60*	*Failure of component I **Failure of component II
	0.50	2.52*	
	0.55	2.52*	
	0.60	3.16*	
	0.63	3.16*	
	0.70	3.16*	
	0.75	3.16*	
	0.88	3.16*	
	1.00	3.16*	
$N_{R,k}$ [kN] for $t_{N,I}$ [mm]	0.40	1.81*	
	0.50	3.78**	
	0.55	3.78**	
	0.60	3.78**	
	0.63	3.78**	
	0.70	3.78**	
	0.75	3.78**	
	0.88	3.78**	
	1.00	3.78**	
$N_{R\,II,k}$ [kN]		3.78**	
max. head displacement "u" depending on sandwich panel thickness [mm]	30	2.1	
	40	2.8	
	50	3.5	
	60	4.2	
	70	4.9	
	80	5.6	
	90	6.3	
	100	7.0	
	110	7.7	
	120	8.4	
	130	9.1	
	≥140	9.8	

Fastening screws for sandwich panels

Self-tapping screws ESTS-0A-S 6,5xL / ESTS-HWH10-0A-S with hexagon head and washer S19, S22, S25 or S29

Annex 146

of European Technical Assessment ETA-16/0734

Materials

Fastener:	galvanized stainless steel
Washer:	S19, S22, S25, S29 – stainless steel washer with EPDM ring
Linear washer:	ELW-S made of stainless steel A2 – EN ISO 3506
Component I:	S280GD, S320GD or S350GD – EN 10346
Component II:	construction wood C24 – EN 14081

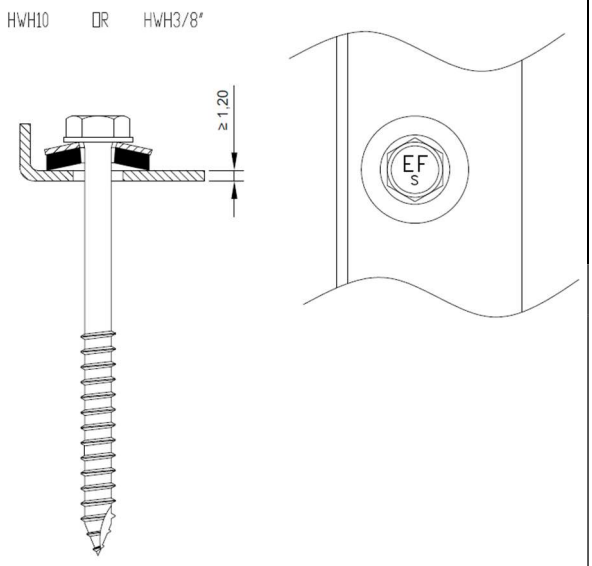
Drilling capacity: -

Timber substructures

For timber structures performance assessed with

$M_{y,Rk}$ = 9,66 Nm

$f_{ax,k}$ = 14,538 N/mm² for l_{ef} ≥ 40 mm



Component II: wood class ≥C24		l_{ef} ≥ 40 [mm]	
$V_{R,k}$ [kN] for $t_{N,I}$ [mm]	0.40	1.60*	*Failure of component I **Failure of component II
	0.50	2.52*	
	0.55	2.52*	
	0.60	3.16*	
	0.63	3.16*	
	0.70	3.16*	
	0.75	3.16*	
	0.88	3.16*	
	1.00	3.16*	
$N_{R,k}$ [kN] for $t_{N,I}$ [mm]	0.40	3.78**	
	0.50	3.78**	
	0.55	3.78**	
	0.60	3.78**	
	0.63	3.78**	
	0.70	3.78**	
	0.75	3.78**	
	0.88	3.78**	
	1.00	3.78**	
$N_{R\,II,k}$ [kN]		3.78**	
max. head displacement "u" depending on sandwich panel thickness [mm]	30	2.1	
	40	2.8	
	50	3.5	
	60	4.2	
	70	4.9	
	80	5.6	
	90	6.3	
	100	7.0	
	110	7.7	
	120	8.4	
	130	9.1	
	≥140	9.8	

Fastening screws for sandwich panels

Self-tapping screws ESTS-0A-S 6,5xL / ESTS-HWH10-0A-S with hexagon head, washer S19, S22, S25 or S29 and linear washer ELW-S

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of European Technical Assessment ETA-16/0734

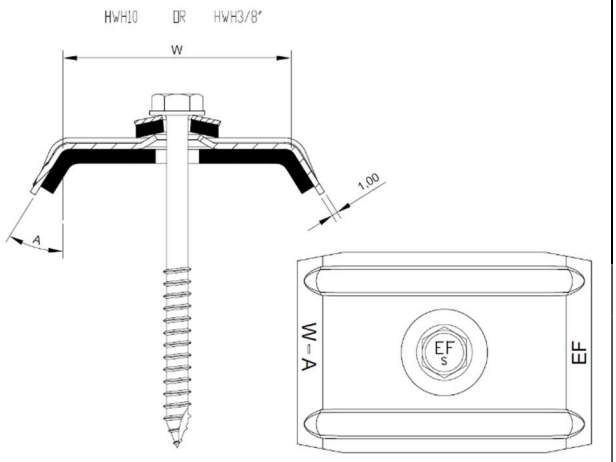
Materials

Fastener:	galvanized stainless steel
Washer:	S19, S22, S25, S29 – stainless steel washer with EPDM ring
Saddle washer:	ESW made of aluminum
Component I:	S280GD, S320GD or S350GD – EN 10346
Component II:	construction wood C24 – EN 14081

Drilling capacity: -

Timber substructures

For timber structures performance assessed with
$M_{y,Rk}$ = 9,66 Nm
$f_{ax,k}$ = 14,538 N/mm² for l_{ef} ≥ 40 mm



Component II: wood class ≥C24		l_{ef} ≥ 40 [mm]	
$V_{R,k}$ [kN] for $t_{N,I}$ [mm]	0.40	1.60*	*Failure of component I **Failure of component II
	0.50	2.52*	
	0.55	2.52*	
	0.60	3.16*	
	0.63	3.16*	
	0.70	3.16*	
	0.75	3.16*	
	0.88	3.16*	
	1.00	3.16*	
$N_{R,k}$ [kN] for $t_{N,I}$ [mm]	0.40	3.78**	
	0.50	3.78**	
	0.55	3.78**	
	0.60	3.78**	
	0.63	3.78**	
	0.70	3.78**	
	0.75	3.78**	
	0.88	3.78**	
	1.00	3.78**	
$N_{R\ II,k}$ [kN]		3.78**	
max. head displacement "u" depending on sandwich panel thickness [mm]	30	2.1	
	40	2.8	
	50	3.5	
	60	4.2	
	70	4.9	
	80	5.6	
	90	6.3	
	100	7.0	
	110	7.7	
	120	8.4	
	130	9.1	
	≥140	9.8	

Fastening screws for sandwich panels

Self-tapping screws ESTS-0A-S 6,5xL / ESTS-HWH10-0A-S
with hexagon head, washer S19, S22, S25 or S29
and saddle washer ESW

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of European
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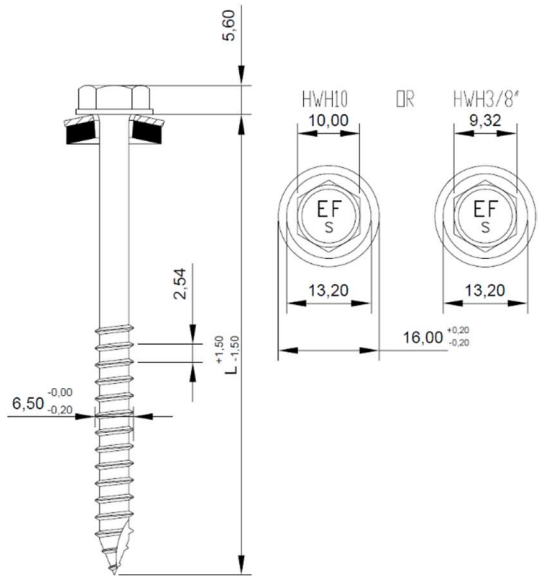
ETA-16/0734

Materials
Fastener: galvanized stainless steel
Washer: S16 – stainless steel washer with EPDM ring
Component I: S280GD, S320GD or S350GD – EN 10346
Component II: construction wood C24 – EN 14081

Drilling capacity: -

Timber substructures
For timber structures performance assessed with
$M_{y,Rk}$ = 9,66 Nm
$f_{ax,k}$ = 14,538 N/mm² for l_{ef} ≥ 40 mm



Component II: wood class ≥C24		l_{ef} ≥ 40 [mm]	
$V_{R,k}$ [kN] for $t_{N,I}$ [mm]	0.40	1.60*	*Failure of component I **Failure of component II
	0.50	2.52*	
	0.55	2.52*	
	0.60	3.16*	
	0.63	3.16*	
	0.70	3.16*	
	0.75	3.16*	
	0.88	3.16*	
	1.00	3.16*	
$N_{R,k}$ [kN] for $t_{N,I}$ [mm]	0.40	1.40*	
	0.50	2.53*	
	0.55	2.53*	
	0.60	2.77*	
	0.63	2.77*	
	0.70	2.89*	
	0.75	2.89*	
	0.88	2.89*	
	1.00	3.78**	
$N_{R\,II,k}$ [kN]		3.78**	
max. head displacement "u" depending on sandwich panel thickness [mm]	30	2.1	
	40	2.8	
	50	3.5	
	60	4.2	
	70	4.9	
	80	5.6	
	90	6.3	
	100	7.0	
	110	7.7	
	120	8.4	
	130	9.1	
	≥140	9.8	

Fastening screws for sandwich panels

Self-tapping screws ESTS-0A-S 6,5xL/ ESTS-HWH10-0A-S with hexagon head and washer S16

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of European Technical Assessment ETA-16/0734

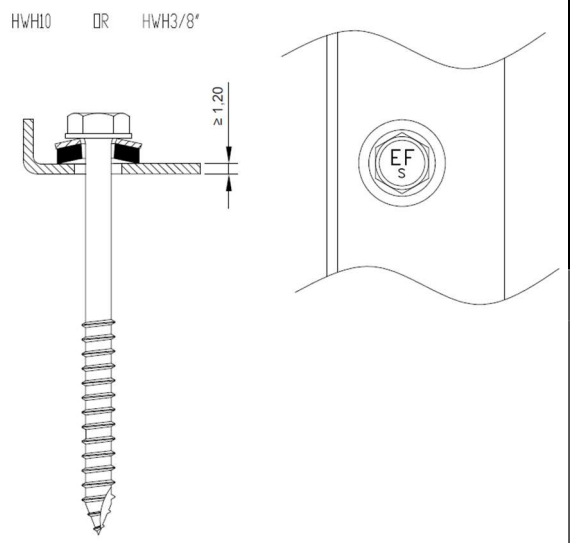
Materials

Fastener:	galvanized stainless steel
Washer:	S16 – stainless steel washer with EPDM ring
Linear washer:	ELW-S made of stainless steel A2 – EN ISO 3506
Component I:	S280GD, S320GD or S350GD – EN 10346
Component II:	construction wood C24 – EN 14081

Drilling capacity: -

Timber substructures

For timber structures performance assessed with
$M_{y,Rk}$ = 9,66 Nm
$f_{ax,k}$ = 14,538 N/mm² for l_{ef} ≥ 40 mm



Component II: wood class ≥C24		l_{ef} ≥ 40 [mm]	
$V_{R,k}$ [kN] for $t_{N,I}$ [mm]	0.40	1.60*	*Failure of component I **Failure of component II
	0.50	2.52*	
	0.55	2.52*	
	0.60	3.16*	
	0.63	3.16*	
	0.70	3.16*	
	0.75	3.16*	
	0.88	3.16*	
	1.00	3.16*	
$N_{R,k}$ [kN] for $t_{N,I}$ [mm]	0.40	3.78**	
	0.50	3.78**	
	0.55	3.78**	
	0.60	3.78**	
	0.63	3.78**	
	0.70	3.78**	
	0.75	3.78**	
	0.88	3.78**	
	1.00	3.78**	
$N_{R\,II,k}$ [kN]		3.78**	
max. head displacement "u" depending on sandwich panel thickness [mm]	30	2.1	
	40	2.8	
	50	3.5	
	60	4.2	
	70	4.9	
	80	5.6	
	90	6.3	
	100	7.0	
	110	7.7	
	120	8.4	
	130	9.1	
	≥140	9.8	

Fastening screws for sandwich panels

Self-tapping screws ESTS-0A-S 6,5xL / ESTS-HWH10-0A-S with hexagon head, washer S16 and linear washer ELW-S

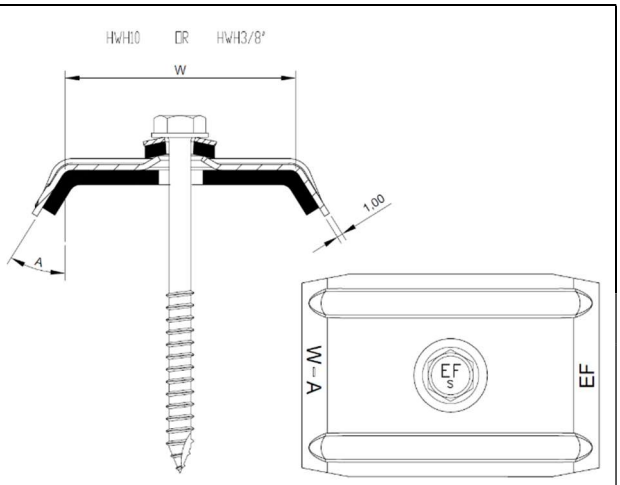
Annex 150

of European Technical Assessment ETA-16/0734

Materials
Fastener: galvanized stainless steel
Washer: S16 – stainless steel washer with EPDM ring
Saddle washer: ESW made of aluminum
Component I: S280GD, S320GD or S350GD – EN 10346
Component II: construction wood C24 – EN 14081

Drilling capacity: -

Timber substructures
For timber structures performance assessed with
$M_{y,Rk}$ = 9,66 Nm
$f_{ax,k}$ = 14,538 N/mm² for l_{ef} ≥ 40 mm



Component II: wood class ≥C24		l_{ef} ≥ 40 [mm]	
$V_{R,k}$ [kN] for $t_{N,I}$ [mm]	0.40	1.60*	*Failure of component I **Failure of component II
	0.50	2.52*	
	0.55	2.52*	
	0.60	3.16*	
	0.63	3.16*	
	0.70	3.16*	
	0.75	3.16*	
	0.88	3.16*	
	1.00	3.16*	
$N_{R,k}$ [kN] for $t_{N,I}$ [mm]	0.40	3.78**	
	0.50	3.78**	
	0.55	3.78**	
	0.60	3.78**	
	0.63	3.78**	
	0.70	3.78**	
	0.75	3.78**	
	0.88	3.78**	
	1.00	3.78**	
$N_{R\ II,k}$ [kN]		3.78**	
max. head displacement "u" depending on sandwich panel thickness [mm]	30	2.1	
	40	2.8	
	50	3.5	
	60	4.2	
	70	4.9	
	80	5.6	
	90	6.3	
	100	7.0	
	110	7.7	
	120	8.4	
	130	9.1	
	≥140	9.8	

Fastening screws for sandwich panels

Self-tapping screws ESTS-0A-S 6,5xL / ESTS-HWH10-0A-S with hexagon head, washer S16 and saddle washer ESW

Annex 151

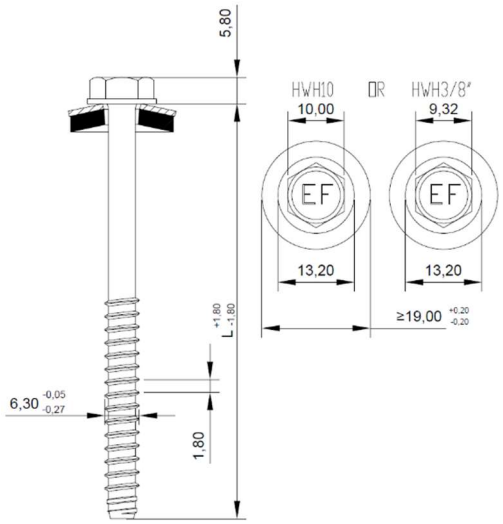
of European Technical Assessment ETA-16/0734

Materials

Fastener:	carbon steel – SAE1022, quenched, tempered and coated: galvanized (12 µm)
Washer:	Z19, Z22, Z25, Z29 – carbon steel washer with EPDM ring
Component I:	S280GD, S320GD or S350GD – EN 10346
Component II:	S235 to S355 – EN 10025-1 S280GD, S320GD or S350GD – EN 10346

Drilling capacity: -

Timber substructures
no performance assessed



$t_{N,II}$ [mm]		2.00	3.00	4.00	5.00	6.00	8.00	10.00	12.00
Drill Ø			5.30			5.50		5.70	
$V_{R,k}$ [kN] for $t_{N,I}$ [mm]	0.50	1.28	1.28	1.28	1.46	1.46	1.46	1.46	1.46
	0.55	1.28	1.28	1.28	1.46	1.46	1.46	1.46	1.46
	0.60	1.28	1.28	1.28	1.46	1.46	1.46	1.46	1.46
	0.63	1.28	1.28	1.28	1.46	1.46	1.46	1.46	1.46
	0.70	1.28	1.28	1.28	1.46	1.46	1.46	1.46	1.46
	0.75	1.91	1.91	1.91	2.15	2.15	2.15	2.15	2.15
	0.88	1.91	1.91	1.91	2.15	2.15	2.15	2.15	2.15
	1.00	2.76	2.76	2.76	3.04	3.04	3.04	3.04	3.04
$N_{R,k}$ [kN] for $t_{N,I}$ [mm]	0.50	4.14	4.14	4.14	4.14	4.14	4.14	4.14	4.14
	0.55	4.14	4.14	4.14	4.14	4.14	4.14	4.14	4.14
	0.60	4.14	4.14	4.14	4.14	4.14	4.14	4.14	4.14
	0.63	4.25	5.10	5.10	5.10	5.10	5.10	5.10	5.10
	0.70	4.25	5.10	5.10	5.10	5.10	5.10	5.10	5.10
	0.75	4.25	6.44	6.44	7.02	7.02	7.02	7.02	7.02
	0.88	4.25	6.44	6.44	7.02	7.02	7.02	7.02	7.02
	1.00	4.25	6.44	6.44	7.02	7.02	7.02	7.02	7.02
$N_{R\ II,k}$ [kN]		4.25	6.44	6.44	7.02	7.02	7.02	7.02	7.02
max. head displacement "u" depending on sandwich panel thickness [mm]	30	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7
	40	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9
	50	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2
	60	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4
	70	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6
	80	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8
	90	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1
	100	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3
	110	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5
	120	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8
	130	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
	≥140	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2

Fastening screws for sandwich panels

Self-tapping screws ESTS-0B-Z 6,3xL / ESTS-HWH10-0B-Z 6,3xL
with hexagon head and washer Z19, Z22, Z25 or Z29

Annex 152

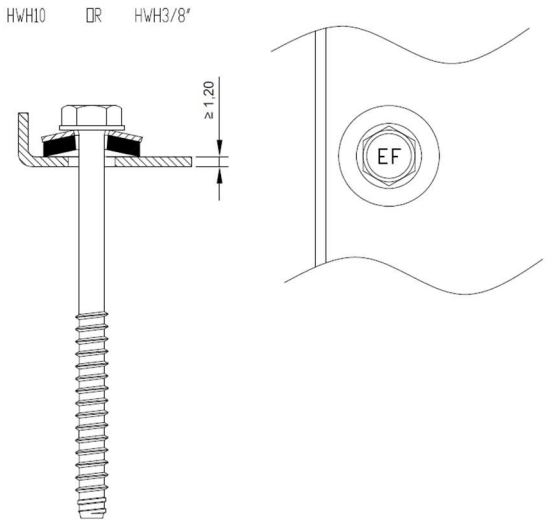
of European Technical Assessment ETA-16/0734

Materials

Fastener:	carbon steel – SAE1022, quenched, tempered and coated: galvanized (12 µm)
Washer:	Z19, Z22, Z25, Z29 – carbon steel washer with EPDM ring
Linear washer:	ELW-Z made of carbon steel – $R_{0,2} \geq 200$ MPa and galvanized min. 200 g/m^2 ELW-S made of stainless steel A2 – EN ISO 3506
Component I:	S280GD, S320GD or S350GD – EN 10346
Component II:	S235 to S355 – EN 10025-1 S280GD, S320GD or S350GD – EN 10346

Drilling capacity: -

Timber substructures
no performance assessed



$t_{N,II}$ [mm]		2.00	3.00	4.00	5.00	6.00	8.00	10.00	12.00
Drill Ø			5.30			5.50		5.70	
$V_{R,k}$ [kN] for $t_{N,I}$ [mm]	0.50	1.28	1.28	1.28	1.46	1.46	1.46	1.46	1.46
	0.55	1.28	1.28	1.28	1.46	1.46	1.46	1.46	1.46
	0.60	1.28	1.28	1.28	1.46	1.46	1.46	1.46	1.46
	0.63	1.28	1.28	1.28	1.46	1.46	1.46	1.46	1.46
	0.70	1.28	1.28	1.28	1.46	1.46	1.46	1.46	1.46
	0.75	1.91	1.91	1.91	2.15	2.15	2.15	2.15	2.15
	0.88	1.91	1.91	1.91	2.15	2.15	2.15	2.15	2.15
	1.00	2.76	2.76	2.76	3.04	3.04	3.04	3.04	3.04
$N_{R,k}$ [kN] for $t_{N,I}$ [mm]	0.50	4.25	6.44	6.44	7.02	7.02	7.02	7.02	7.02
	0.55	4.25	6.44	6.44	7.02	7.02	7.02	7.02	7.02
	0.60	4.25	6.44	6.44	7.02	7.02	7.02	7.02	7.02
	0.63	4.25	6.44	6.44	7.02	7.02	7.02	7.02	7.02
	0.70	4.25	6.44	6.44	7.02	7.02	7.02	7.02	7.02
	0.75	4.25	6.44	6.44	7.02	7.02	7.02	7.02	7.02
	0.88	4.25	6.44	6.44	7.02	7.02	7.02	7.02	7.02
	1.00	4.25	6.44	6.44	7.02	7.02	7.02	7.02	7.02
$N_{R\ II,k}$ [kN]		4.25	6.44	6.44	7.02	7.02	7.02	7.02	7.02
max. head displacement "u" depending on sandwich panel thickness [mm]	30	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7
	40	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9
	50	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2
	60	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4
	70	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6
	80	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8
	90	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1
	100	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3
	110	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5
	120	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8
	130	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
	≥140	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2

Fastening screws for sandwich panels

Self-tapping screws ESTS-0B-Z 6,3xL / ESTS-HWH10-0B-Z 6,3xL
with hexagon head, washer Z19, Z22, Z25 or Z29
and linear washer ELW-Z or ELW-S

Annex 153

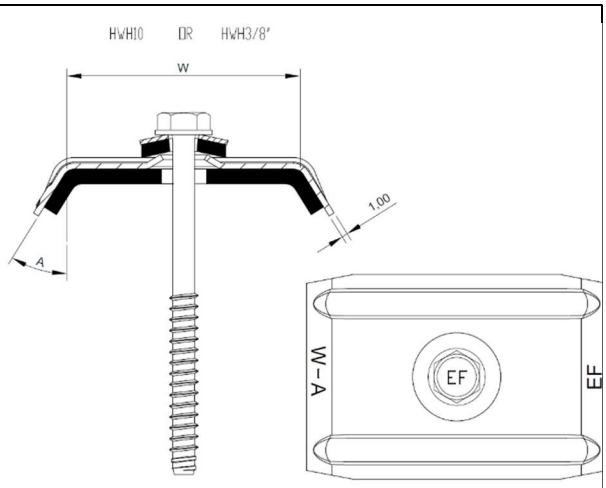
of European Technical Assessment ETA-16/0734

Materials

Fastener:	carbon steel – SAE1022, quenched, tempered and coated: galvanized (12 µm)
Washer:	Z19, Z22, Z25, Z29 – carbon steel washer with EPDM ring
Saddle washer:	ESW made of aluminum
Component I:	S280GD, S320GD or S350GD – EN 10346
Component II:	S235 to S355 – EN 10025-1 S280GD, S320GD or S350GD – EN 10346

Drilling capacity: -

Timber substructures
no performance assessed



$t_{N,II}$ [mm]		2.00	3.00	4.00	5.00	6.00	8.00	10.00	12.00
Drill Ø			5.30			5.50		5.70	
$V_{R,k}$ [kN] for $t_{N,I}$ [mm]	0.50	1.28	1.28	1.28	1.46	1.46	1.46	1.46	1.46
	0.55	1.28	1.28	1.28	1.46	1.46	1.46	1.46	1.46
	0.60	1.28	1.28	1.28	1.46	1.46	1.46	1.46	1.46
	0.63	1.28	1.28	1.28	1.46	1.46	1.46	1.46	1.46
	0.70	1.28	1.28	1.28	1.46	1.46	1.46	1.46	1.46
	0.75	1.91	1.91	1.91	2.15	2.15	2.15	2.15	2.15
	0.88	1.91	1.91	1.91	2.15	2.15	2.15	2.15	2.15
	1.00	2.76	2.76	2.76	3.04	3.04	3.04	3.04	3.04
$N_{R,k}$ [kN] for $t_{N,I}$ [mm]	0.50	4.25	6.44	6.44	7.02	7.02	7.02	7.02	7.02
	0.55	4.25	6.44	6.44	7.02	7.02	7.02	7.02	7.02
	0.60	4.25	6.44	6.44	7.02	7.02	7.02	7.02	7.02
	0.63	4.25	6.44	6.44	7.02	7.02	7.02	7.02	7.02
	0.70	4.25	6.44	6.44	7.02	7.02	7.02	7.02	7.02
	0.75	4.25	6.44	6.44	7.02	7.02	7.02	7.02	7.02
	0.88	4.25	6.44	6.44	7.02	7.02	7.02	7.02	7.02
	1.00	4.25	6.44	6.44	7.02	7.02	7.02	7.02	7.02
$N_{R\ II,k}$ [kN]		4.25	6.44	6.44	7.02	7.02	7.02	7.02	7.02
max. head displacement "u" depending on sandwich panel thickness [mm]	30	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7
	40	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9
	50	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2
	60	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4
	70	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6
	80	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8
	90	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1
	100	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3
	110	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5
	120	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8
	130	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
	≥140	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2

Fastening screws for sandwich panels

Self-tapping screws ESTS-0B-Z 6,3xL / ESTS-HWH10-0B-Z 6,3xL
with hexagon head, washer Z19, Z22, Z25 or Z29
and saddle washer ESW

Annex 154

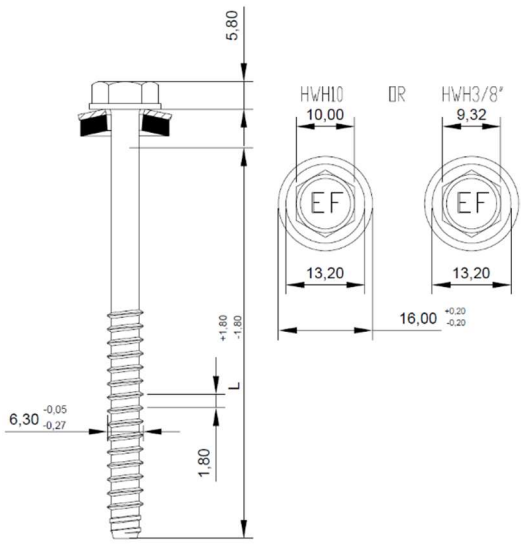
of European
Technical Assessment
ETA-16/0734

Materials

Fastener:	carbon steel – SAE1022, quenched, tempered and coated: galvanized (12 µm)
Washer:	Z16 – carbon steel washer with EPDM ring
Component I:	S280GD, S320GD or S350GD – EN 10346
Component II:	S235 to S355 – EN 10025-1 S280GD, S320GD or S350GD – EN 10346

Drilling capacity: -

Timber substructures
no performance assessed



$t_{N,II}$ [mm]		2.00	3.00	4.00	5.00	6.00	8.00	10.00	12.00
Drill Ø			5.30			5.50		5.70	
$V_{R,k}$ [kN] for $t_{N,I}$ [mm]	0.50	1.28	1.28	1.28	1.46	1.46	1.46	1.46	1.46
	0.55	1.28	1.28	1.28	1.46	1.46	1.46	1.46	1.46
	0.60	1.28	1.28	1.28	1.46	1.46	1.46	1.46	1.46
	0.63	1.28	1.28	1.28	1.46	1.46	1.46	1.46	1.46
	0.70	1.28	1.28	1.28	1.46	1.46	1.46	1.46	1.46
	0.75	1.91	1.91	1.91	2.15	2.15	2.15	2.15	2.15
	0.88	1.91	1.91	1.91	2.15	2.15	2.15	2.15	2.15
	1.00	2.76	2.76	2.76	3.04	3.04	3.04	3.04	3.04
$N_{R,k}$ [kN] for $t_{N,I}$ [mm]	0.50	2.53	2.53	2.53	2.53	2.53	2.53	2.53	2.53
	0.55	2.53	2.53	2.53	2.53	2.53	2.53	2.53	2.53
	0.60	2.77	2.77	2.77	2.77	2.77	2.77	2.77	2.77
	0.63	2.77	2.77	2.77	2.77	2.77	2.77	2.77	2.77
	0.70	2.89	2.89	2.89	2.89	2.89	2.89	2.89	2.89
	0.75	2.89	2.89	2.89	2.89	2.89	2.89	2.89	2.89
	0.88	2.89	2.89	2.89	2.89	2.89	2.89	2.89	2.89
	1.00	4.25	4.27	4.27	4.27	4.27	4.27	4.27	4.27
$N_{R\ II,k}$ [kN]		4.25	6.44	6.44	7.02	7.02	7.02	7.02	7.02
max. head displacement "u" depending on sandwich panel thickness [mm]	30	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7
	40	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9
	50	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2
	60	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4
	70	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6
	80	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8
	90	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1
	100	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3
	110	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5
	120	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8
	130	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
	≥140	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2

Fastening screws for sandwich panels

Self-tapping screws ESTS-0B-Z 6,3xL / ESTS-HWH10-0B-Z 6,3xL with hexagon head and washer Z16

Annex 155

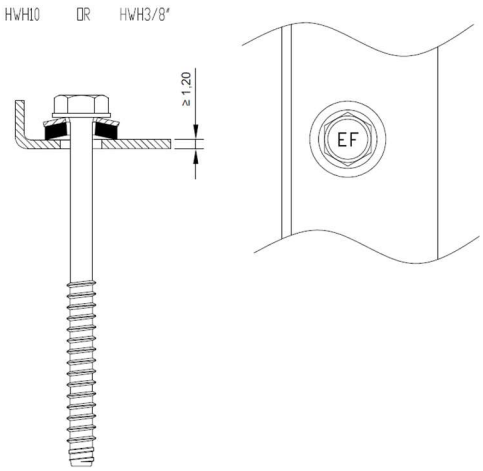
of European Technical Assessment ETA-16/0734

Materials

Fastener:	carbon steel – SAE1022, quenched, tempered and coated: galvanized (12 µm)
Washer:	Z16 – carbon steel washer with EPDM ring
Linear washer:	ELW-Z made of carbon steel – $R_{0,2} \geq 200$ MPa and galvanized min. 200 g/m^2 ELW-S made of stainless steel A2 – EN ISO 3506
Component I:	S280GD, S320GD or S350GD – EN 10346
Component II:	S235 to S355 – EN 10025-1 S280GD, S320GD or S350GD – EN 10346

Drilling capacity: -

Timber substructures
no performance assessed



$t_{N,II}$ [mm]		2.00	3.00	4.00	5.00	6.00	8.00	10.00	12.00
Drill Ø			5.30			5.50		5.70	
$V_{R,k}$ [kN] for $t_{N,I}$ [mm]	0.50	1.28	1.28	1.28	1.46	1.46	1.46	1.46	1.46
	0.55	1.28	1.28	1.28	1.46	1.46	1.46	1.46	1.46
	0.60	1.28	1.28	1.28	1.46	1.46	1.46	1.46	1.46
	0.63	1.28	1.28	1.28	1.46	1.46	1.46	1.46	1.46
	0.70	1.28	1.28	1.28	1.46	1.46	1.46	1.46	1.46
	0.75	1.91	1.91	1.91	2.15	2.15	2.15	2.15	2.15
	0.88	1.91	1.91	1.91	2.15	2.15	2.15	2.15	2.15
	1.00	2.76	2.76	2.76	3.04	3.04	3.04	3.04	3.04
$N_{R,k}$ [kN] for $t_{N,I}$ [mm]	0.50	4.25	6.44	6.44	7.02	7.02	7.02	7.02	7.02
	0.55	4.25	6.44	6.44	7.02	7.02	7.02	7.02	7.02
	0.60	4.25	6.44	6.44	7.02	7.02	7.02	7.02	7.02
	0.63	4.25	6.44	6.44	7.02	7.02	7.02	7.02	7.02
	0.70	4.25	6.44	6.44	7.02	7.02	7.02	7.02	7.02
	0.75	4.25	6.44	6.44	7.02	7.02	7.02	7.02	7.02
	0.88	4.25	6.44	6.44	7.02	7.02	7.02	7.02	7.02
	1.00	4.25	6.44	6.44	7.02	7.02	7.02	7.02	7.02
$N_{R\ II,k}$ [kN]		4.25	6.44	6.44	7.02	7.02	7.02	7.02	7.02
max. head displacement "u" depending on sandwich panel thickness [mm]	30	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7
	40	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9
	50	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2
	60	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4
	70	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6
	80	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8
	90	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1
	100	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3
	110	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5
	120	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8
	130	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
	≥140	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2

Fastening screws for sandwich panels

Self-tapping screws ESTS-0B-Z 6,3xL / ESTS-HWH10-0B-Z 6,3xL
with hexagon head, washer Z16
and linear washer ELW-Z or ELW-S

Annex 156

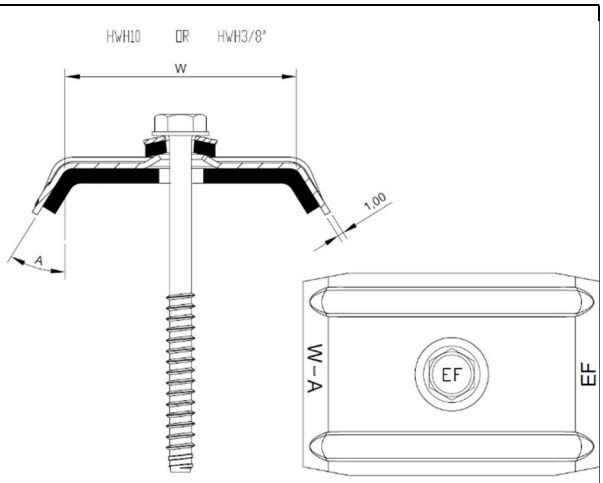
of European Technical Assessment ETA-16/0734

Materials

Fastener:	carbon steel – SAE1022, quenched, tempered and coated: galvanized (12 µm)
Washer:	Z16 – carbon steel washer with EPDM ring
Saddle washer:	ESW made of aluminum
Component I:	S280GD, S320GD or S350GD – EN 10346
Component II:	S235 to S355 – EN 10025-1 S280GD, S320GD or S350GD – EN 10346

Drilling capacity: -

Timber substructures
no performance assessed



$t_{N,II}$ [mm]		2.00	3.00	4.00	5.00	6.00	8.00	10.00	12.00
Drill Ø			5.30			5.50		5.70	
$V_{R,k}$ [kN] for $t_{N,I}$ [mm]	0.50	1.28	1.28	1.28	1.46	1.46	1.46	1.46	1.46
	0.55	1.28	1.28	1.28	1.46	1.46	1.46	1.46	1.46
	0.60	1.28	1.28	1.28	1.46	1.46	1.46	1.46	1.46
	0.63	1.28	1.28	1.28	1.46	1.46	1.46	1.46	1.46
	0.70	1.28	1.28	1.28	1.46	1.46	1.46	1.46	1.46
	0.75	1.91	1.91	1.91	2.15	2.15	2.15	2.15	2.15
	0.88	1.91	1.91	1.91	2.15	2.15	2.15	2.15	2.15
	1.00	2.76	2.76	2.76	3.04	3.04	3.04	3.04	3.04
$N_{R,k}$ [kN] for $t_{N,I}$ [mm]	0.50	4.25	6.44	6.44	7.02	7.02	7.02	7.02	7.02
	0.55	4.25	6.44	6.44	7.02	7.02	7.02	7.02	7.02
	0.60	4.25	6.44	6.44	7.02	7.02	7.02	7.02	7.02
	0.63	4.25	6.44	6.44	7.02	7.02	7.02	7.02	7.02
	0.70	4.25	6.44	6.44	7.02	7.02	7.02	7.02	7.02
	0.75	4.25	6.44	6.44	7.02	7.02	7.02	7.02	7.02
	0.88	4.25	6.44	6.44	7.02	7.02	7.02	7.02	7.02
	1.00	4.25	6.44	6.44	7.02	7.02	7.02	7.02	7.02
$N_{R\ II,k}$ [kN]		4.25	6.44	6.44	7.02	7.02	7.02	7.02	7.02
max. head displacement "u" depending on sandwich panel thickness [mm]	30	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7
	40	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9
	50	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2
	60	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4
	70	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6
	80	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8
	90	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1
	100	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3
	110	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5
	120	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8
	130	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
	≥140	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2

Fastening screws for sandwich panels

Self-tapping screws ESTS-0B-Z 6,3xL / ESTS-HWH10-0B-Z 6,3xL with hexagon head, washer Z16 and saddle washer ESW

Annex 157

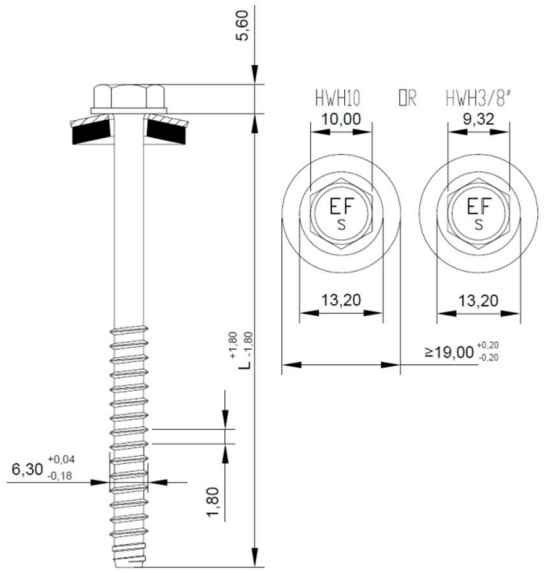
of European Technical Assessment ETA-16/0734

Materials

Fastener:	galvanized stainless steel
Washer:	S19, S22, S25, S29 – stainless steel washer with EPDM ring
Component I:	S280GD, S320GD or S350GD – EN 10346
Component II:	S235 to S355 – EN 10025-1 S280GD, S320GD or S350GD – EN 10346

Drilling capacity: -

Timber substructures
no performance assessed



$t_{N,II}$ [mm]		2.00	3.00	4.00	5.00	6.00	8.00	10.00	12.00
Drill Ø		5.30			5.50		5.70		
$V_{R,k}$ [kN] for $t_{N,I}$ [mm]	0.50	1.28	1.28	1.28	1.46	1.46	1.46	1.46	1.46
	0.55	1.28	1.28	1.28	1.46	1.46	1.46	1.46	1.46
	0.60	1.28	1.28	1.28	1.46	1.46	1.46	1.46	1.46
	0.63	1.28	1.28	1.28	1.46	1.46	1.46	1.46	1.46
	0.70	1.28	1.28	1.28	1.46	1.46	1.46	1.46	1.46
	0.75	1.91	1.91	1.91	2.15	2.15	2.15	2.15	2.15
	0.88	1.91	1.91	1.91	2.15	2.15	2.15	2.15	2.15
	1.00	2.76	2.76	2.76	3.04	3.04	3.04	3.04	3.04
$N_{R,k}$ [kN] for $t_{N,I}$ [mm]	0.50	3.79	4.14	4.14	4.14	4.14	4.14	4.14	4.14
	0.55	3.79	4.14	4.14	4.14	4.14	4.14	4.14	4.14
	0.60	3.79	4.14	4.14	4.14	4.14	4.14	4.14	4.14
	0.63	3.79	5.10	5.10	5.10	5.10	5.10	5.10	5.10
	0.70	3.79	5.10	5.10	5.10	5.10	5.10	5.10	5.10
	0.75	3.79	6.86	6.86	6.86	6.86	6.86	6.86	6.86
	0.88	3.79	6.86	6.86	6.86	6.86	6.86	6.86	6.86
	1.00	3.79	6.86	6.86	6.86	6.86	6.86	6.86	6.86
$N_{R\ II,k}$ [kN]		3.79	6.86	6.86	6.86	6.86	6.86	6.86	6.86
max. head displacement "u" depending on sandwich panel thickness [mm]	30	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1
	40	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8
	50	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
	60	4.2	4.2	4.2	4.2	4.2	4.2	4.2	4.2
	70	4.9	4.9	4.9	4.9	4.9	4.9	4.9	4.9
	80	5.6	5.6	5.6	5.6	5.6	5.6	5.6	5.6
	90	6.3	6.3	6.3	6.3	6.3	6.3	6.3	6.3
	100	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0
	110	7.7	7.7	7.7	7.7	7.7	7.7	7.7	7.7
	120	8.4	8.4	8.4	8.4	8.4	8.4	8.4	8.4
	130	9.1	9.1	9.1	9.1	9.1	9.1	9.1	9.1
	≥140	9.8	9.8	9.8	9.8	9.8	9.8	9.8	9.8

Fastening screws for sandwich panels

Self-tapping screws ESTS-0B-S 6,3xL / ESTS-HWH10-0B-S 6,3x with hexagon head and washer S19, S22, S25 or S29

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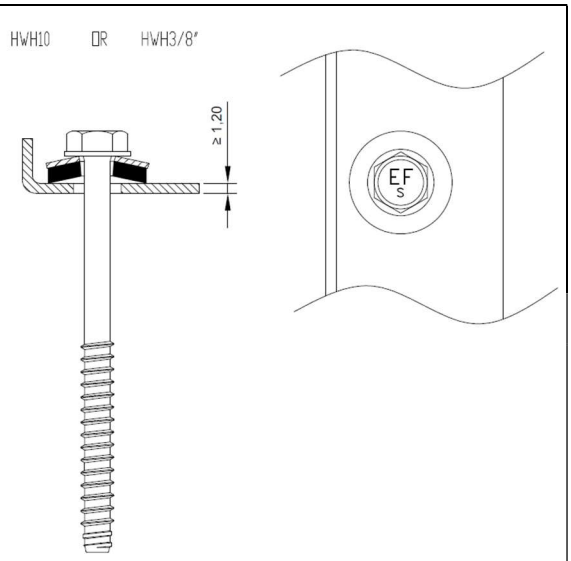
Materials

Fastener:	galvanized stainless steel
Washer:	S19, S22, S25, S29 – stainless steel washer with EPDM ring
Linear washer:	ELW-S made of stainless steel A2 – EN ISO 3506
Component I:	S280GD, S320GD or S350GD – EN 10346
Component II:	S235 to S355 – EN 10025-1 S280GD, S320GD or S350GD – EN 10346

Drilling capacity: -

Timber substructures
no performance assessed



$t_{N,II}$ [mm]		2.00	3.00	4.00	5.00	6.00	8.00	10.00	12.00
Drill Ø		5.30			5.50		5.70		
$V_{R,k}$ [kN] for $t_{N,I}$ [mm]	0.50	1.28	1.28	1.28	1.46	1.46	1.46	1.46	1.46
	0.55	1.28	1.28	1.28	1.46	1.46	1.46	1.46	1.46
	0.60	1.28	1.28	1.28	1.46	1.46	1.46	1.46	1.46
	0.63	1.28	1.28	1.28	1.46	1.46	1.46	1.46	1.46
	0.70	1.28	1.28	1.28	1.46	1.46	1.46	1.46	1.46
	0.75	1.91	1.91	1.91	2.15	2.15	2.15	2.15	2.15
	0.88	1.91	1.91	1.91	2.15	2.15	2.15	2.15	2.15
	1.00	2.76	2.76	2.76	3.04	3.04	3.04	3.04	3.04
$N_{R,k}$ [kN] for $t_{N,I}$ [mm]	0.50	3.79	6.86	6.86	6.86	6.86	6.86	6.86	6.86
	0.55	3.79	6.86	6.86	6.86	6.86	6.86	6.86	6.86
	0.60	3.79	6.86	6.86	6.86	6.86	6.86	6.86	6.86
	0.63	3.79	6.86	6.86	6.86	6.86	6.86	6.86	6.86
	0.70	3.79	6.86	6.86	6.86	6.86	6.86	6.86	6.86
	0.75	3.79	6.86	6.86	6.86	6.86	6.86	6.86	6.86
	0.88	3.79	6.86	6.86	6.86	6.86	6.86	6.86	6.86
	1.00	3.79	6.86	6.86	6.86	6.86	6.86	6.86	6.86
$N_{R\ II,k}$ [kN]		3.79	6.86	6.86	6.86	6.86	6.86	6.86	6.86
max. head displacement "u" depending on sandwich panel thickness [mm]	30	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1
	40	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8
	50	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
	60	4.2	4.2	4.2	4.2	4.2	4.2	4.2	4.2
	70	4.9	4.9	4.9	4.9	4.9	4.9	4.9	4.9
	80	5.6	5.6	5.6	5.6	5.6	5.6	5.6	5.6
	90	6.3	6.3	6.3	6.3	6.3	6.3	6.3	6.3
	100	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0
	110	7.7	7.7	7.7	7.7	7.7	7.7	7.7	7.7
	120	8.4	8.4	8.4	8.4	8.4	8.4	8.4	8.4
	130	9.1	9.1	9.1	9.1	9.1	9.1	9.1	9.1
	≥140	9.8	9.8	9.8	9.8	9.8	9.8	9.8	9.8

Fastening screws for sandwich panels

Self-tapping screws ESTS-0B-S 6,3xL / ESTS-HWH10-0B-S 6,3xL
with hexagon head, washer S19, S22, S25 or S29
and linear washer ELW-S

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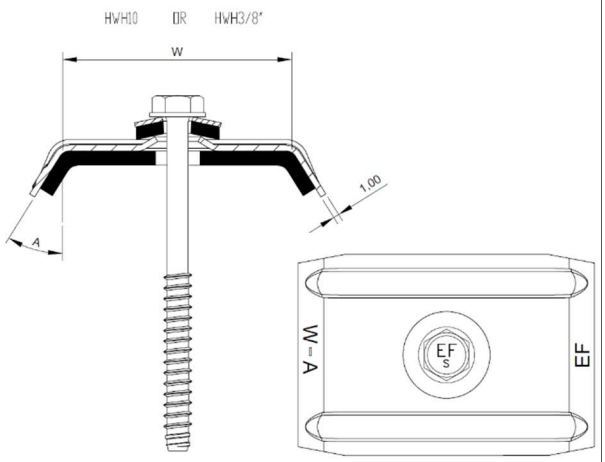
Materials

Fastener:	galvanized stainless steel
Washer:	S19, S22, S25, S29 – stainless steel washer with EPDM ring
Saddle washer:	ESW made of aluminum
Component I:	S280GD, S320GD or S350GD – EN 10346
Component II:	S235 to S355 – EN 10025-1 S280GD, S320GD or S350GD – EN 10346

Drilling capacity: -

Timber substructures
no performance assessed



$t_{N,II}$ [mm]		2.00	3.00	4.00	5.00	6.00	8.00	10.00	12.00
Drill Ø			5.30			5.50		5.70	
$V_{R,k}$ [kN] for $t_{N,I}$ [mm]	0.50	1.28	1.28	1.28	1.46	1.46	1.46	1.46	1.46
	0.55	1.28	1.28	1.28	1.46	1.46	1.46	1.46	1.46
	0.60	1.28	1.28	1.28	1.46	1.46	1.46	1.46	1.46
	0.63	1.28	1.28	1.28	1.46	1.46	1.46	1.46	1.46
	0.70	1.28	1.28	1.28	1.46	1.46	1.46	1.46	1.46
	0.75	1.91	1.91	1.91	2.15	2.15	2.15	2.15	2.15
	0.88	1.91	1.91	1.91	2.15	2.15	2.15	2.15	2.15
	1.00	2.76	2.76	2.76	3.04	3.04	3.04	3.04	3.04
$N_{R,k}$ [kN] for $t_{N,I}$ [mm]	0.50	3.79	6.86	6.86	6.86	6.86	6.86	6.86	6.86
	0.55	3.79	6.86	6.86	6.86	6.86	6.86	6.86	6.86
	0.60	3.79	6.86	6.86	6.86	6.86	6.86	6.86	6.86
	0.63	3.79	6.86	6.86	6.86	6.86	6.86	6.86	6.86
	0.70	3.79	6.86	6.86	6.86	6.86	6.86	6.86	6.86
	0.75	3.79	6.86	6.86	6.86	6.86	6.86	6.86	6.86
	0.88	3.79	6.86	6.86	6.86	6.86	6.86	6.86	6.86
	1.00	3.79	6.86	6.86	6.86	6.86	6.86	6.86	6.86
$N_{R\ II,k}$ [kN]		3.79	6.86	6.86	6.86	6.86	6.86	6.86	6.86
max. head displacement "u" depending on sandwich panel thickness [mm]	30	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1
	40	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8
	50	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
	60	4.2	4.2	4.2	4.2	4.2	4.2	4.2	4.2
	70	4.9	4.9	4.9	4.9	4.9	4.9	4.9	4.9
	80	5.6	5.6	5.6	5.6	5.6	5.6	5.6	5.6
	90	6.3	6.3	6.3	6.3	6.3	6.3	6.3	6.3
	100	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0
	110	7.7	7.7	7.7	7.7	7.7	7.7	7.7	7.7
	120	8.4	8.4	8.4	8.4	8.4	8.4	8.4	8.4
	130	9.1	9.1	9.1	9.1	9.1	9.1	9.1	9.1
	≥140	9.8	9.8	9.8	9.8	9.8	9.8	9.8	9.8

Fastening screws for sandwich panels

Self-tapping screws ESTS-0B-S 6,3xL / ESTS-HWH10-0B-S 6,3xL
with hexagon head, washer S19, S22, S25 or S29
and saddle washer ESW

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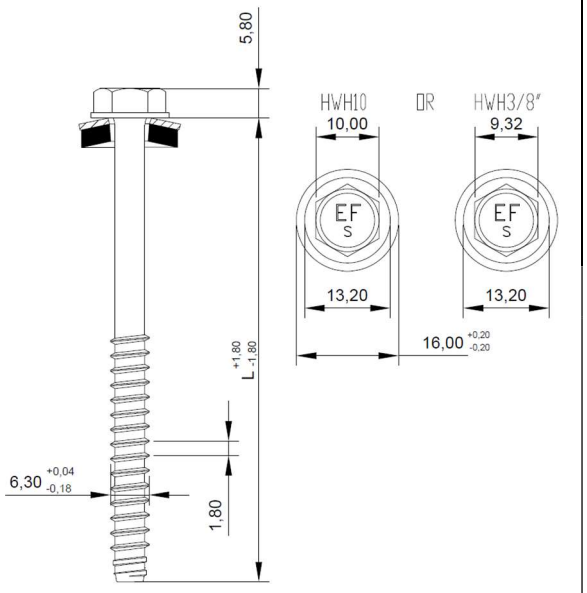
Materials
Fastener: galvanized stainless steel
Washer: S16 – stainless steel washer with EPDM ring
Component I: S280GD, S320GD or S350GD – EN 10346
Component II: S235 to S355 – EN 10025-1
S280GD, S320GD or S350GD – EN 10346

Drilling capacity: -

Timber substructures
no performance assessed



$t_{N,II}$ [mm]		2.00	3.00	4.00	5.00	6.00	8.00	10.00	12.00
Drill Ø			5.30			5.50		5.70	
$V_{R,k}$ [kN] for $t_{N,I}$ [mm]	0.50	1.28	1.28	1.28	1.46	1.46	1.46	1.46	1.46
	0.55	1.28	1.28	1.28	1.46	1.46	1.46	1.46	1.46
	0.60	1.28	1.28	1.28	1.46	1.46	1.46	1.46	1.46
	0.63	1.28	1.28	1.28	1.46	1.46	1.46	1.46	1.46
	0.70	1.28	1.28	1.28	1.46	1.46	1.46	1.46	1.46
	0.75	1.91	1.91	1.91	2.15	2.15	2.15	2.15	2.15
	0.88	1.91	1.91	1.91	2.15	2.15	2.15	2.15	2.15
	1.00	2.76	2.76	2.76	3.04	3.04	3.04	3.04	3.04
$N_{R,k}$ [kN] for $t_{N,I}$ [mm]	0.50	2.53	2.53	2.53	2.53	2.53	2.53	2.53	2.53
	0.55	2.53	2.53	2.53	2.53	2.53	2.53	2.53	2.53
	0.60	2.77	2.77	2.77	2.77	2.77	2.77	2.77	2.77
	0.63	2.77	2.77	2.77	2.77	2.77	2.77	2.77	2.77
	0.70	2.89	2.89	2.89	2.89	2.89	2.89	2.89	2.89
	0.75	2.89	2.89	2.89	2.89	2.89	2.89	2.89	2.89
	0.88	2.89	2.89	2.89	2.89	2.89	2.89	2.89	2.89
	1.00	3.79	4.27	4.27	4.27	4.27	4.27	4.27	4.27
$N_{R\ II,k}$ [kN]		3.79	6.86	6.86	6.86	6.86	6.86	6.86	6.86
max. head displacement "u" depending on sandwich panel thickness [mm]	30	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1
	40	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8
	50	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
	60	4.2	4.2	4.2	4.2	4.2	4.2	4.2	4.2
	70	4.9	4.9	4.9	4.9	4.9	4.9	4.9	4.9
	80	5.6	5.6	5.6	5.6	5.6	5.6	5.6	5.6
	90	6.3	6.3	6.3	6.3	6.3	6.3	6.3	6.3
	100	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0
	110	7.7	7.7	7.7	7.7	7.7	7.7	7.7	7.7
	120	8.4	8.4	8.4	8.4	8.4	8.4	8.4	8.4
	130	9.1	9.1	9.1	9.1	9.1	9.1	9.1	9.1
	≥140	9.8	9.8	9.8	9.8	9.8	9.8	9.8	9.8

Fastening screws for sandwich panels

Self-tapping screws ESTS-0B-S 6,3xL / ESTS-HWH10-0B-S 6,3xL
with hexagon head and washer S16

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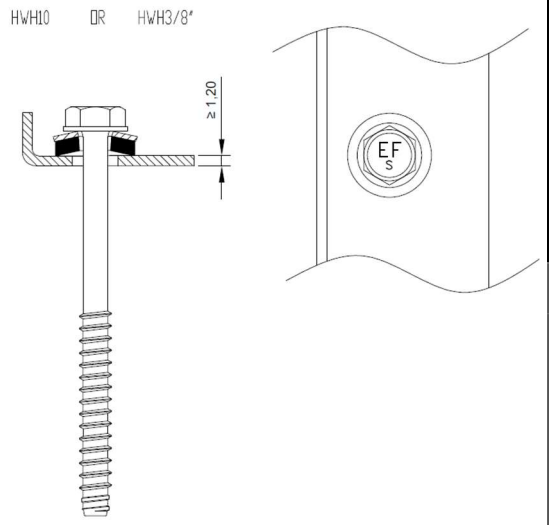
Materials

Fastener:	galvanized stainless steel
Washer:	S16 – stainless steel washer with EPDM ring
Linear washer:	ELW-S made of stainless steel A2 – EN ISO 3506
Component I:	S280GD, S320GD or S350GD – EN 10346
Component II:	S235 to S355 – EN 10025-1 S280GD, S320GD or S350GD – EN 10346

Drilling capacity: -

Timber substructures
no performance assessed



$t_{N,II}$ [mm]		2.00	3.00	4.00	5.00	6.00	8.00	10.00	12.00
Drill Ø		5.30			5.50		5.70		
$V_{R,k}$ [kN] for $t_{N,I}$ [mm]	0.50	1.28	1.28	1.28	1.46	1.46	1.46	1.46	1.46
	0.55	1.28	1.28	1.28	1.46	1.46	1.46	1.46	1.46
	0.60	1.28	1.28	1.28	1.46	1.46	1.46	1.46	1.46
	0.63	1.28	1.28	1.28	1.46	1.46	1.46	1.46	1.46
	0.70	1.28	1.28	1.28	1.46	1.46	1.46	1.46	1.46
	0.75	1.91	1.91	1.91	2.15	2.15	2.15	2.15	2.15
	0.88	1.91	1.91	1.91	2.15	2.15	2.15	2.15	2.15
	1.00	2.76	2.76	2.76	3.04	3.04	3.04	3.04	3.04
$N_{R,k}$ [kN] for $t_{N,I}$ [mm]	0.50	3.79	6.86	6.86	6.86	6.86	6.86	6.86	6.86
	0.55	3.79	6.86	6.86	6.86	6.86	6.86	6.86	6.86
	0.60	3.79	6.86	6.86	6.86	6.86	6.86	6.86	6.86
	0.63	3.79	6.86	6.86	6.86	6.86	6.86	6.86	6.86
	0.70	3.79	6.86	6.86	6.86	6.86	6.86	6.86	6.86
	0.75	3.79	6.86	6.86	6.86	6.86	6.86	6.86	6.86
	0.88	3.79	6.86	6.86	6.86	6.86	6.86	6.86	6.86
	1.00	3.79	6.86	6.86	6.86	6.86	6.86	6.86	6.86
$N_{R\ II,k}$ [kN]		3.79	6.86	6.86	6.86	6.86	6.86	6.86	6.86
max. head displacement "u" depending on sandwich panel thickness [mm]	30	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1
	40	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8
	50	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
	60	4.2	4.2	4.2	4.2	4.2	4.2	4.2	4.2
	70	4.9	4.9	4.9	4.9	4.9	4.9	4.9	4.9
	80	5.6	5.6	5.6	5.6	5.6	5.6	5.6	5.6
	90	6.3	6.3	6.3	6.3	6.3	6.3	6.3	6.3
	100	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0
	110	7.7	7.7	7.7	7.7	7.7	7.7	7.7	7.7
	120	8.4	8.4	8.4	8.4	8.4	8.4	8.4	8.4
	130	9.1	9.1	9.1	9.1	9.1	9.1	9.1	9.1
	≥140	9.8	9.8	9.8	9.8	9.8	9.8	9.8	9.8

Fastening screws for sandwich panels

Self-tapping screws ESTS-0B-S 6,3xL / ESTS-HWH10-0B-S 6,3xL with hexagon head, washer S16 and linear washer ELW-S

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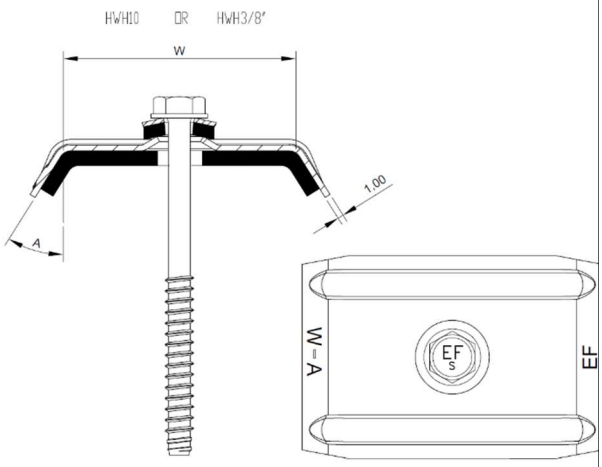
Materials
Fastener: galvanized stainless steel
Washer: S16 – stainless steel washer with EPDM ring
Saddle washer: ESW made of aluminum
Component I: S280GD, S320GD or S350GD – EN 10346
Component II: S235 to S355 – EN 10025-1
S280GD, S320GD or S350GD – EN 10346

Drilling capacity: -

Timber substructures
no performance assessed



$t_{N,II}$ [mm]		2.00	3.00	4.00	5.00	6.00	8.00	10.00	12.00
Drill Ø			5.30			5.50		5.70	
$V_{R,k}$ [kN] for $t_{N,I}$ [mm]	0.50	1.28	1.28	1.28	1.46	1.46	1.46	1.46	1.46
	0.55	1.28	1.28	1.28	1.46	1.46	1.46	1.46	1.46
	0.60	1.28	1.28	1.28	1.46	1.46	1.46	1.46	1.46
	0.63	1.28	1.28	1.28	1.46	1.46	1.46	1.46	1.46
	0.70	1.28	1.28	1.28	1.46	1.46	1.46	1.46	1.46
	0.75	1.91	1.91	1.91	2.15	2.15	2.15	2.15	2.15
	0.88	1.91	1.91	1.91	2.15	2.15	2.15	2.15	2.15
	1.00	2.76	2.76	2.76	3.04	3.04	3.04	3.04	3.04
$N_{R,k}$ [kN] for $t_{N,I}$ [mm]	0.50	3.79	6.86	6.86	6.86	6.86	6.86	6.86	6.86
	0.55	3.79	6.86	6.86	6.86	6.86	6.86	6.86	6.86
	0.60	3.79	6.86	6.86	6.86	6.86	6.86	6.86	6.86
	0.63	3.79	6.86	6.86	6.86	6.86	6.86	6.86	6.86
	0.70	3.79	6.86	6.86	6.86	6.86	6.86	6.86	6.86
	0.75	3.79	6.86	6.86	6.86	6.86	6.86	6.86	6.86
	0.88	3.79	6.86	6.86	6.86	6.86	6.86	6.86	6.86
	1.00	3.79	6.86	6.86	6.86	6.86	6.86	6.86	6.86
$N_{R\ II,k}$ [kN]		3.79	6.86	6.86	6.86	6.86	6.86	6.86	6.86
max. head displacement "u" depending on sandwich panel thickness [mm]	30	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1
	40	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8
	50	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
	60	4.2	4.2	4.2	4.2	4.2	4.2	4.2	4.2
	70	4.9	4.9	4.9	4.9	4.9	4.9	4.9	4.9
	80	5.6	5.6	5.6	5.6	5.6	5.6	5.6	5.6
	90	6.3	6.3	6.3	6.3	6.3	6.3	6.3	6.3
	100	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0
	110	7.7	7.7	7.7	7.7	7.7	7.7	7.7	7.7
	120	8.4	8.4	8.4	8.4	8.4	8.4	8.4	8.4
	130	9.1	9.1	9.1	9.1	9.1	9.1	9.1	9.1
	≥140	9.8	9.8	9.8	9.8	9.8	9.8	9.8	9.8

Fastening screws for sandwich panels

Self-tapping screws ESTS-0B-S 6,3xL / ESTS-HWH10-0B-S 6,3xL with hexagon head, washer S16 and saddle washer ESW

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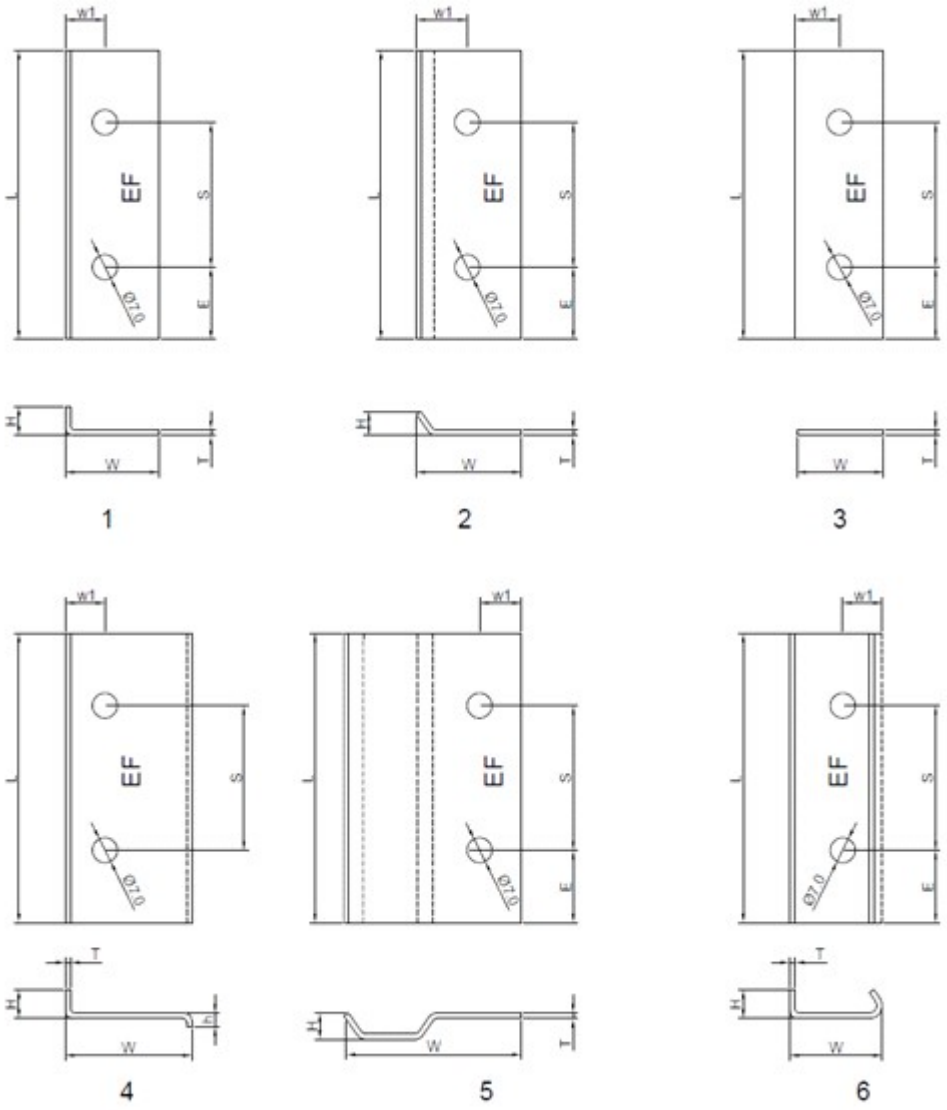

ELW-Z – made of carbon steel

ELW-S – made of stainless steel

	Dimensions, mm								Numer of holes
	W	L	H	E	S	w1	T	h	
1	≥ 14	≥ 50	≥ 5	≥ 10	≥ 20	≥ 8	≥ 1.2	-	≥ 1
2	≥ 14	≥ 50	≥ 5	≥ 10	≥ 20	≥ 8	≥ 1.2	-	≥ 1
3	≥ 14	≥ 50	-	≥ 10	≥ 20	≥ 8	≥ 1.2	-	≥ 1
4	≥ 14	≥ 50	≥ 5	≥ 10	≥ 20	≥ 8	≥ 1.2	≥ 5	≥ 1
5	≥ 14	≥ 50	≥ 5	≥ 10	≥ 20	≥ 8	≥ 1.2	-	≥ 1
6	≥ 14	≥ 50	≥ 5	≥ 10	≥ 20	≥ 8	≥ 1.2	-	≥ 1

Fastening screws for sandwich panels

Linear washers details

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Determination of Design Values

1. Determination of Design Shear Resistance

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

For Metal Supporting Substructures the following applies:

The design values $V_{R,d}$ of the shear resistance are the characteristic values of the shear resistance divided by the recommended partial safety factor 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 $\gamma\ M$ 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.