

FAQ - The new fastener mask in SandStat.

Since May 2018, the new fastener mask is available. You will find below a short overview of the new mask and important topics.

This new mask is not included in the basic version if applicable and must be activated in the license file.

Furthermore, this mask is only available for elements according to the calculation method "General Technical Approval with DIN EN 14509, Appendix E" or according to "EN 14509".

The calculation principle according to the old approval "General Technical Approval, Annex A", which is not valid since at least the end of 2015, will no longer be developed in this area.

Overview of the new mask

Choice and design of the fasteners with regard to the connection with the sub-construction

basic information

ABZ ETA ETB **a)**

only valid approvals

only self drilling screws stainless

order by: manufacturer NRK value

panel-width: mm

verdecktPLUS

b)

E.u.r.o. Tec EJOT End Hilti IPEX

PMJ Reisser S + P SFS Würth

other

support 5

Refabo Plus-K6,3 x L (Ø>=16)

Z-14.4-407 ANX 2.19
issued on 02.12.2014

Reisser Schraubentechnik GmbH
Fritz-Müller Straße 10
D-74653 Ingelfingen-Criesbach

all supports identical

no	variation	material	tll/lef		fastener	type of fastening	NSd [kN]	NRd [kN]	d)	
			[mm]	asym.					exist. [mm]	max u [mm]
1	visible	S235	4,00	<input type="checkbox"/>	JT3-18-5,5 x L (Ø16)	w/ washer	2,24	3,61	62,0%	0,84 22,50 ⓘ
2	hidden	S355	3,00	<input type="checkbox"/>	E-X Bohr 3 HAT 5,5 x L (Ø19)	w/ washer - S19	2,82	3,01	93,9%	0,84 12,00 ⓘ
3	hidden	S235	3,00	<input type="checkbox"/>	E-X Bohr 3 HAT 5,5 x L (Ø16)	Z 200°50,5°8°8°1,5 - S16	1,37	6,02	22,9%	0,84 12,00 ⓘ
4	hidden	timber	35	<input type="checkbox"/>	REISSER RP+P-6,0 (Ø19)	w/ washer - S19	2,82	3,32	85,0%	0,84 12,00 ⓘ
5	visible	S235	2,00	<input checked="" type="checkbox"/>	Refabo Plus-K6,3 x L (Ø>=16)	w/ washer	2,24	2,21	101,2%	0,84 23,00 ⓘ

c)

(arbitrary example without rating of the individual fasteners)

The screen is divided into the following sections:

- a) Top left: Specification of calculation basis of the fastener
- b) Top center: Selection of the desired fastener manufacturer/s
- c) Bottom: Information on the specific support formation and the connection
- d) Bottom right: Results for the resistance of the selected fastener

a) Calculation basis of the fastener

basic information

ABZ ETA ETB
 only valid approvals
 only self drilling screws stainless
order by manufacturer NRk value

panel-width mm
 verdecktPLUS

ABZ	All fasteners with a Technical Approval of DIBt are displayed
ETA	All fasteners according to an European Technical Approval are displayed (European Technical Approval – in German: Europäische Technische Zulassung)
ETB	All fasteners following an European Technical Assessment are displayed (European Technical Assessment – in German: Europäische Technische Bewertung). This option is removed with version 4.7.28; up to this version those fasteners are displayed at the designation "ETA".
only valid approvals	only fasteners with a valid approval are displayed. Please deactivate this option for the recalculation of old static calculations with expired screw approvals
only self drilling screws	only self drilling screws are displayed
stainless	only fasteners made of stainless material are displayed
order by	<ul style="list-style-type: none"> - manufacturer: The selection list of fasteners is sorted alphabetically by manufacturer and fastener name - NRk-value: The selection list of fasteners is sorted by the resistance value of the fastener
panel-width	Specification of the element width in mm
verdecktPlus	please note the explanations on page 9

b) Selection of the desired manufacturer

In this section you can preselect the manufacturer(s) of fastener(s).

The designation corresponds to the designation in the approval/ETA.

The corresponding manufacturer information is displayed to the right of the selection.

c) Information on support formation

no	variation	material	tII/lef [mm]	asym
1	visible	S235	4,00	<input type="checkbox"/>
2	hidden	S355	3,00	<input type="checkbox"/>
3	hidden	S235	3,00	<input type="checkbox"/>
4	hidden	timber	35	<input type="checkbox"/>
5	visible	S235	2,00	<input checked="" type="checkbox"/>

(arbitrary example without rating of the individual fasteners)

For each support of the system, starting at the left or bottom of the panel.

variation	Selection of the "visible" variant for visible fastening or "hidden" for hidden/invisible fixings. The option "hidden" is only available if this usage is regulated in the approval for the selected sandwich element.
material	Material of the substructure
tII/leff	Thickness of the substructure (for steel substructure) or screw-in depth (for timber substructure)
asym.	the substructure (component II) is asymmetrical (Z- or C-profiles). For a component thickness $t_{II} < 5$ mm the characteristic value $N_{R,k}$ is reduced to 70 % if this option is activated.

n.	fastener	type of fastening
2	JT3-18-5,5 x L (Ø16)	w/ washer
1	E× Bohr 3 HAT 5,5 x L (Ø19)	w/ washer - S19
2	E× Bohr 3 HAT 5,5 x L (Ø16)	Z 200*50,5*8*8*1,5 - S16
1	REISSER RP-r-P-6,0 (Ø19)	w/ washer - S19
2	Refabo Plus-K6,3 x L (Ø>=16)	w/ washer

(Arbitrary example without rating of the individual fasteners)

1st column	number of fasteners
fastener	the selected fastener with the designation of the approval
type of fastening	depending on the selected fastener or the selected type of hidden fixings, further options are available here e.g. with regard to the washer, the load distribution plate etc.

d) Results

NSd [kN]	NRd [kN]		exist. [mm]	max u [mm]	
2,24	3,61	62,0%	0,84	22,50	ⓘ
2,82	3,01	93,9%	0,84	12,00	ⓘ
1,37	6,02	22,9%	0,84	12,00	ⓘ
2,82	3,32	85,0%	0,84	12,00	ⓘ
2,24	2,21	101,2%	0,84	23,00	ⓘ

N _{Sd}	Design value of the tensile force for the decisive load combination in kN
N _{Rd}	Design value of the tensile strength of the selected fastener in kN
3rd column	utilization factor for tensile strength
exist u	Existing screw head deflection in mm
max u	maximum allowable screw head deflection in mm

If no proof has been provided, this is marked in red by a colour coding of the utilization.

In the case of hidden fixings, the place of failure is indicated by an abbreviation:

Example:

3,52	3,01 ^{II}	117,1%	II	failure of fastener (pull out of the substructure, buttoning over or failure of the fastener)
3,52	2,60 ^V	135,4%	V	failure of hidden fixing (pull over)

Furthermore, the ratios are summarized in the lower right corner of the mask with 4 coloured spots:



Spot 1 – proof of tensile force

Spot 2 – screw head deflection

Spot 3 – Shear force analysis (in process)

Spot 4 – tensile force-transverse force interaction (in process)

Colour	utilization	
green	< 100 %	fulfilled
orange	< 103 %	still okay
red	> 103 %	not fulfilled
grey	not yet implemented	

This allows you to see at a glance - especially with a large number of supports - whether the selection is sufficiently load-bearing.

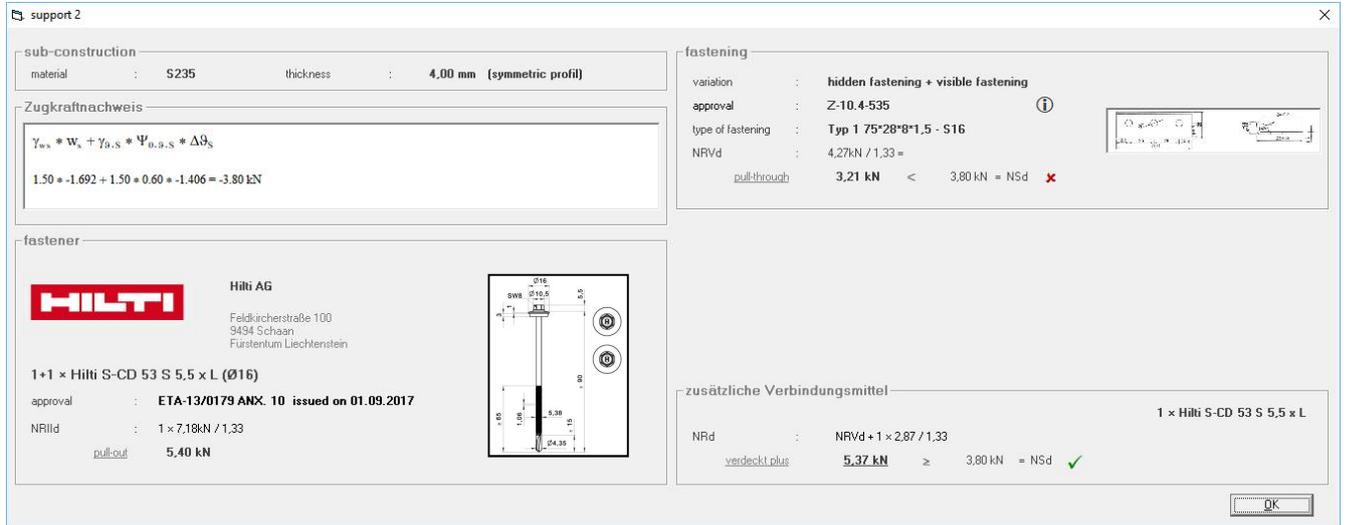
Note at this point:

In the near future, the mask will be extended to include the design of the shear load bearing capacity of the fastener and the interaction of the tensile force and the shear force. Therefore, some additions will follow at this point during one of the next updates.

Informations

By clicking the info  button, the basics of the design for this support are displayed.

Example on the support with hidden fixing:



The screenshot shows the 'support 2' software interface with the following sections:

- sub-construction:**
 - material : 5235
 - thickness : 4,00 mm (symmetric profil)
- Zugkraftnachweis:**

$$Y_{w,s} * W_s + Y_{p,s} * \Psi_{0,9,s} * \Delta \vartheta_s$$

$$1,50 * -1,692 + 1,50 * 0,60 * -1,406 = -3,80 \text{ kN}$$
- fastener:**
 - HILTI** Hilti AG
 - Feldkircherstraße 100, 9494 Schaan, Fürstentum Liechtenstein
 - 1 × 1 × Hilti S-CD 53 S 5,5 x L (Ø16)
 - approval : ETA-13/0179 ANX. 10 issued on 01.09.2017
 - NRd : 1 × 7,18 kN / 1,33
 - pull-out : 5,40 kN
- fastening:**
 - variation : hidden fastening + visible fastening
 - approval : Z-10.4-535 
 - type of fastening : Typ 1 75*28*8*1,5 - S16
 - NRVd : 4,27 kN / 1,33 =
 - pull-through : 3,21 kN < 3,80 kN = NSd ❌
- zusätzliche Verbindungsmittel:**
 - NRd : NRVd + 1 × 2,87 / 1,33
 - verdeckt plus : 5,37 kN ≥ 3,80 kN = NSd ✅
 - 1 × Hilti S-CD 53 S 5,5 x L

The sketches of the selected fasteners and load distribution plate are displayed partly. If the sketches are poorly displayed due to the resolution, you can click on the corresponding sketch with the mouse and the sketch will be enlarged.

By selecting the additional info  button - if available - the corresponding installation page of the approval is displayed as a pdf file. An appropriate pdf program is required to display this file.

Hints for hidden fixing

verdecktPLUS

The option "verdecktPLUS" can be selected for hidden fixing.

Please activate this option if you have an exceeding at the hidden fixing. Then the system determines how many additional fasteners are required directly (i.e. visibly). Both the output mask and the printout will then contain, for example, "1+2" - i.e. a fastener at hidden fixing and two additional visible fasteners.

The same fasteners are used both for the hidden fixing and for the visible fixing.

Example without activation of „verdecktPLUS“:

2	E× Bohr 3 HAT 5,5 x L (Ø19)	mit Dichtscheibe - S19	3,52	3,08 ^V	114,3%
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Example with activation of „verdecktPLUS“:

2+1	E× Bohr 3 HAT 5,5 x L (Ø19)	mit Dichtscheibe - S19	3,52	5,34	66,0%
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Hidden fixings limitations

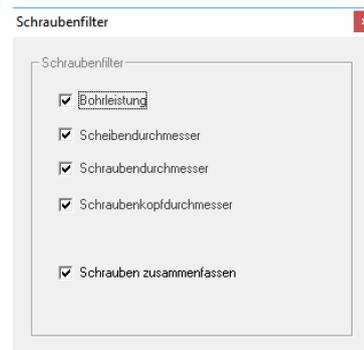
The specifications for hidden fixing are defined in the corresponding sandwich approval. For each approval, the specifications for the fasteners are also mentioned.

These can include the following specifications:

	Example:	german word at mask "Schraubenfilter"
washer	<ul style="list-style-type: none"> - without washer - with washer Ø 16 - with washer >= 19 mm 	Scheibendurchmesser
fastener diameter	<ul style="list-style-type: none"> - without specification - fastener diameter = 6,3 mm - fastener diameter >= 5,5 mm 	Schraubendurchmesser
screw head diameter		Schraubenkopfdurchmesser

These controls were not included in the old version of the fastener mask. Therefore, the new version may no longer display certain fasteners that were previously displayed to you.

If you want a specific fastener that is not displayed in the selection mask not anymore, please press the key combination **[alt] + [SHIFT] + [F]**. Now you can deactivate the corresponding restriction in the mask that is then displayed (will be translated soon):



Please pay attention to the correct hidden fixing and check whether this deviation is feasible and also formally correct.

A corresponding note is then printed in the printout (will be translated soon):

Ohne Berücksichtigung des Dichtscheibendurchmessers.

Ohne Berücksichtigung des Schraubendurchmessers.

Ohne Berücksichtigung der Bohrleistung.

