FAQ – How can I change the sandwich panel properties or add new sandwich panels to SandStat?

SandStat contains a module with which you can change existing sandwich panel characterstics or integrate a new element. This module is not included in the basic version and should be purchased separately.
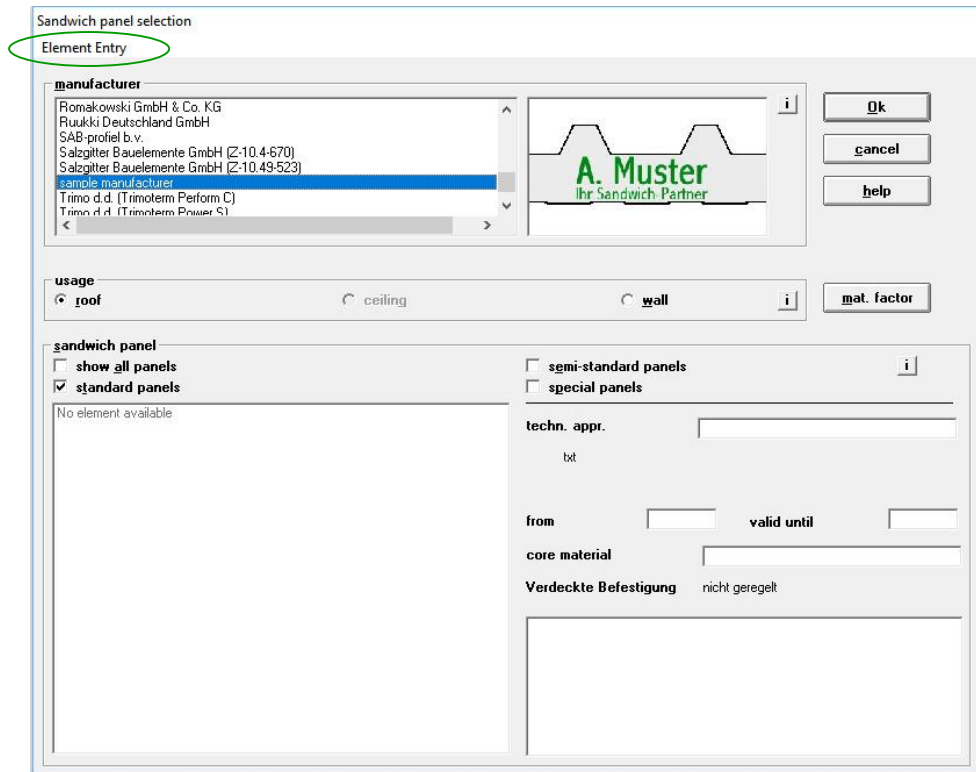
General procedure

 Definition of design procdure (depending on license)

 Selection of the sandwich panel to be calculated

Explanatory notes

In the dialog "Sandwich panel selection" the menu item "Element Entry" is visible, if the module is purchased and activated:

1) Selecting a panel that has already been entered

The user-defined panels are stored in a separate database. The change between the databases takes place via the menu item "Show my elements".
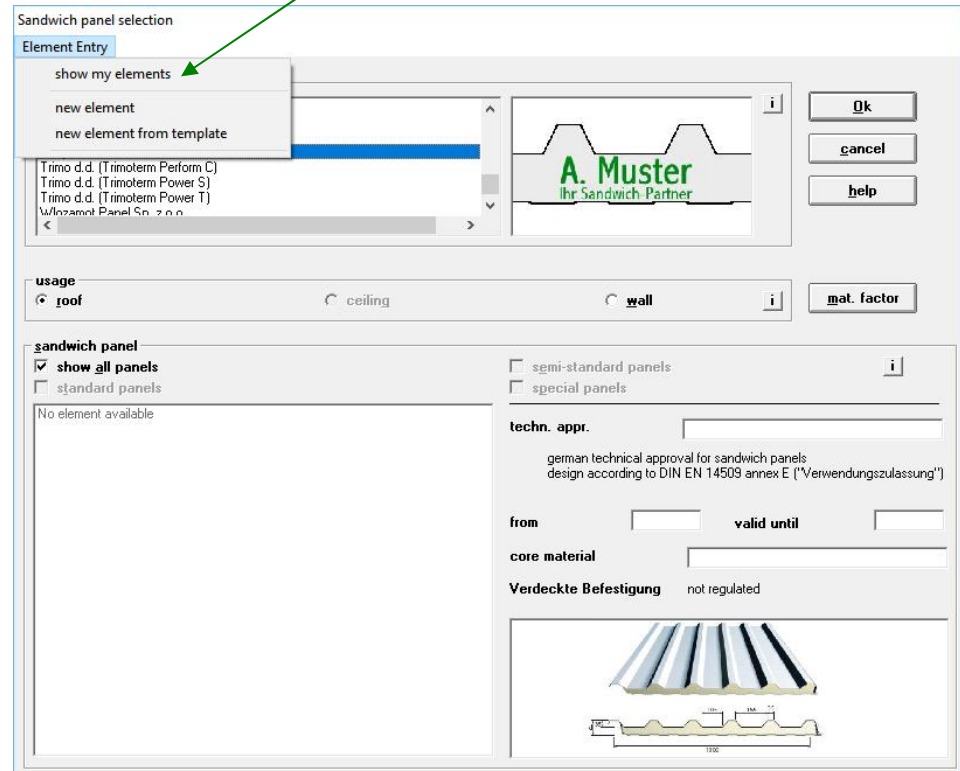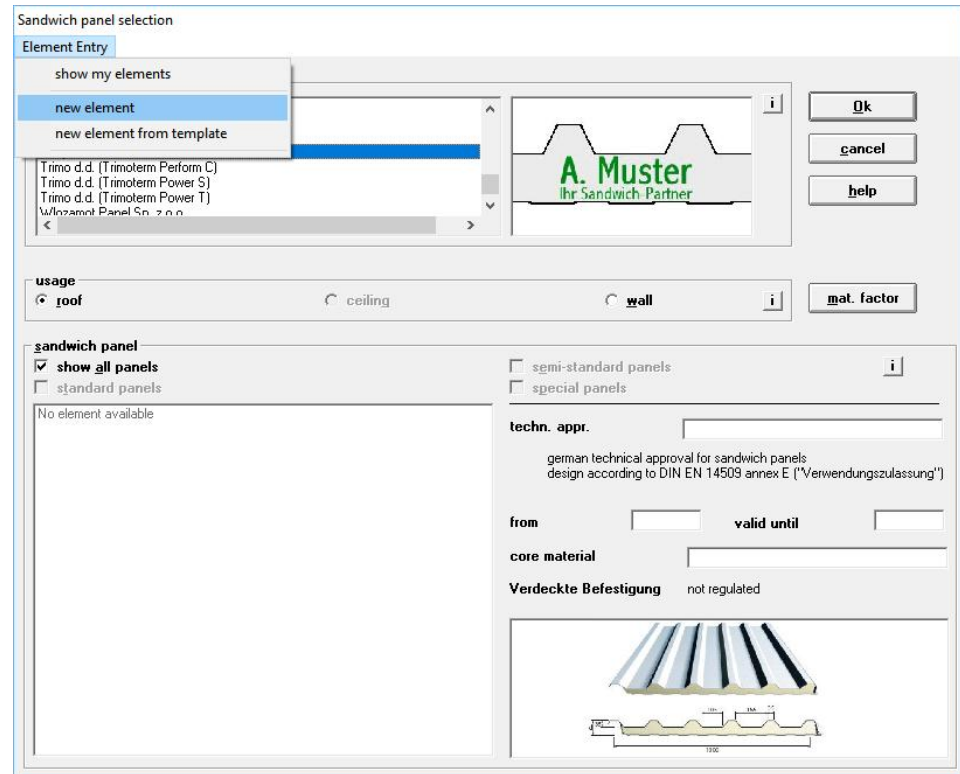

All panels that you have entered manually in the database are displayed.

To switch to the elements that have already been entered into the database by our site, deactivate the "Show my elements" option.
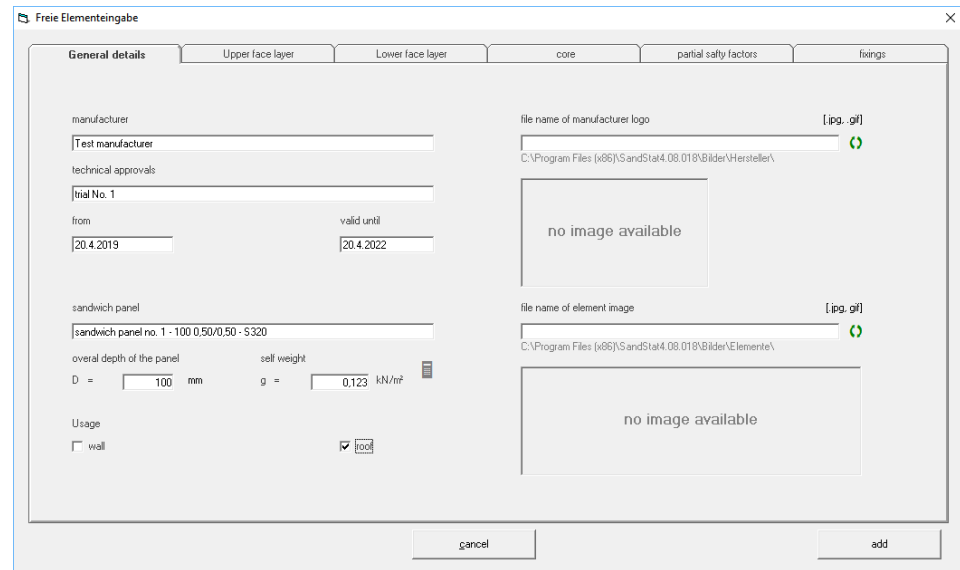
2) Creation of a new panel

Select the menu item „new element" at „Element entry":

In the following dialogue, the characteristic values of the new panel can be defined.

Index „General details"

•	manufacturer	designation of manufacturer
•	technical approval	Designation of the approval or the basis of the characteristic values (e.g. CE mark, Certification Document etc.)
•	from	validity from
•	valid until	validity until
•	sandwich panel	designation of sandwich panel
•	D	overall depth of the panel [mm]
•	g	self weight [kN/m²]
•		Calculator symbol: automatic determination of the seif weight, if the bulk densities of the face layers and the core as well as the face layer thicknesses have been defined on the other index cards.
•	wall / roof	Place of use: wall and/or roof. In the near future this module will also be extended with the application site ceiling and interior wall.
	In the right area of the mask, manufacturer logos and element sketches can be defined. The corresponding files must be contained in the displayed directory.	

Index „Upper face layer"

	Geometry	
•	tN1	Nominal sheet thickness (thickness including zinc coating) in mm
•	zinc1	Zinc layer thickness in mm (usually 0.04 mm)
•		Tool for determining the cross-section values (nominal sheet thickness and zinc layer thickness must be defined beforehand; for explanation please refer to the following pages)
•	A1	Cross-sectional area (without zinc layer = netto cross-sectional area) in cm²/m

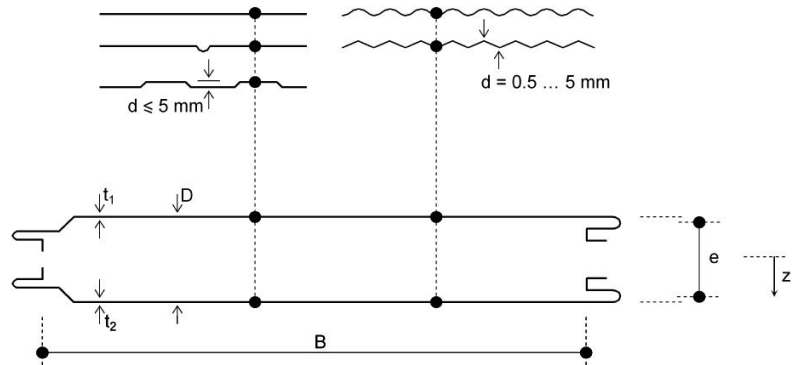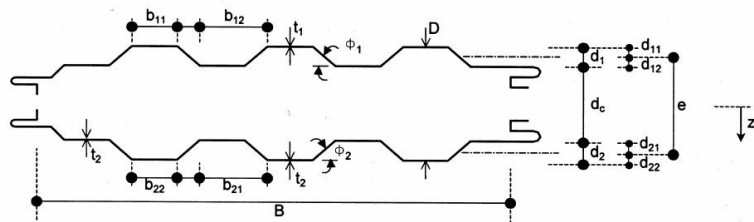|		
•	I1	Moment of inertia (without zinc layer = netto moment of inertia) in cm^4/m
		For lightly profiled faces:
		According to EN 14509, the inherent rigidity of the surface course may be neglected for lightly profiled faces (both in the evaluation and in the design). In this case, the value for the moment of inertia is **I = 0 cm^4/m** to be entered.
		Excerpt from EN 14509:
		Figure E.1 a) – Panel cross-section, flat, lightly profiled or microprofile face
		For profiled faces:
		Excerpt from EN 14509:
		Figure E.1 b) – Panel cross-section, profiled face and material properties of a sandwich panel
•	d11	distance between centroid of outer face layer to outer surface of face layer in mm
•	d12	distance between centroid of outer face layer to inner surface of face layer in mm

		Wrinkling stresses -> charakteristic value in [N/mm²]
•	S_{w1f}	in span
•	S_{w1s}	at support
•	S_{w1f+}	in span with a temperature of face layer above 20°C
•	S_{w1s+}	at support with a temperatur of face layer above 20°C
	reduction	Reduction of wrinkling stresses as a function of the number of fasteners (usually with flat or lightly profiled faces)
	Material	
•	name	designation of material
•	E	E-modulus of outer face layer (steel: 210 000 N/mm²)
•	aT	coefficient of thermal expansion of outer face layer (steel: 0,000012 1/°)
•	ft	charakteristic yield strength of outer face layer in N/mm²
•	rhoM	bulk density of outer face layer (steel: 8000 kg/m³)
•		The cross-sectional values are adapted to changes in the nominal sheet thickness.
•	creeps	The outer surface layer consists of a material which can creep (e.g. GRP surface layers). Further information is required (modulus of elasticity long-term, yield strength long-term etc.).

Tool for determining the cross-section values

The cross-section values of the surface layer can be calculated in the following tool:
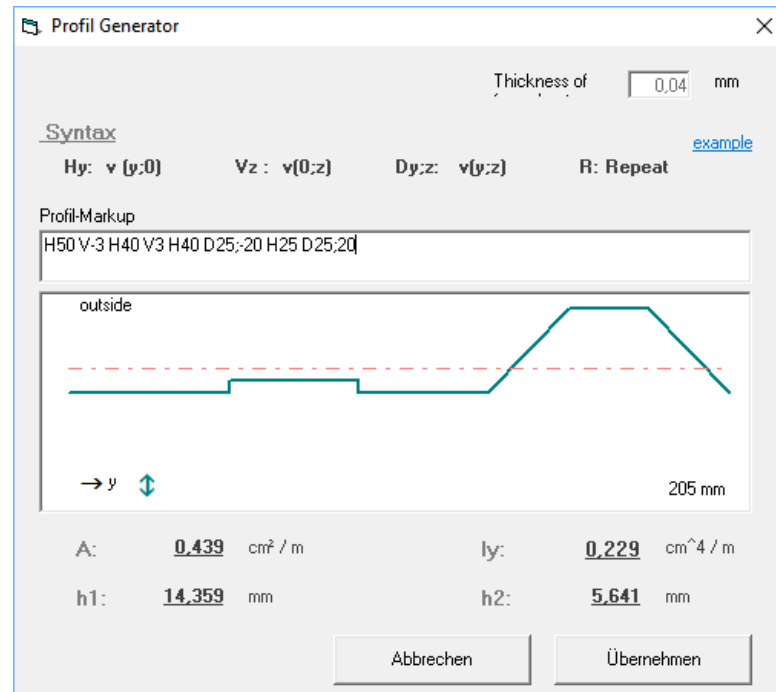
Starting from the left, the face layer "expired" and the alignment (top/bottom; right; diagonal) as well as the distance are defined.

Using the example above:

H50	Horizontally right 50 mm
V-3	Vertically top 3 mm
H40	Horizontally right 40 mm
V3	Vertically down 3 mm
H50	Horizontally right 50 mm
D25;-20	Diagonally 25 mm right and 20 mm top
H25	Horizontally right 25 mm
D25;20	Diagonally 25 mm right and 20 mm down

The letter "R" repeats the entered geometry to a width of 1000 mm.

Index „Lower face layer"

è   Analogous to index „Upper face layer"

Index „core"

		Core material
•	name	designation of core material
•	Material	Selection field for the classification of the core material. Possible selections are: EPS, MW, PIR, PUR and others ("sonstige").
		Charakteristic values
•	G_c	shear modulus of core material [N/mm²]
•	$G_{c,T+}$	shear modulus of core material at elevated temperature [N/mm²]
•	rhoC	bulk density of core [kg/m³]
•	f_{Cv}	shear strength of core material [N/mm²]
•	$f_{Cv,L}$	shear strength of core material at long term loads (self weight and/or snow) [N/mm²]
•	$f_{Cv,T+}$	shear strength of core material at elevated temperature [N/mm²]
•	f_{Cc}	compression strength of core material [N/mm²]
•	f_{Ct}	tensile strength of core material [N/mm²]
•	phi2k	creep coefficient of core material for snow loads (2.000 h); if necessary according to EN 14509, E.7.6
•	phi100k	creep coefficient of core material for self weight (100.000 h); if necessary according to EN 14509, E.7.6
•	k	parameter of support reaction capacity k (if necessary according to nach EN 14509, E.4.3.2)

Index „partial safety factors"

The partial safety factors can be defined here:

- è Material safetc factors
  The material safety factors according to EN 14509, Tab. E.9 are given as default settings. If necessary, these factors must be adjusted according to the specifications or test results and the national regulations.

- è Load factors
  At this point the load factors can be predefined. This is a default setting which can still be changed in the course of the design of the element in the "Overall control" mask.

- è Combination coefficents
  At this point the combination coefficients can be predefined. This is a default setting which can still be changed in the course of the design of the element in the "Overall control" mask.

Index „fixings"

The sandwich panels entered in this module all have the possibility to be fixed directly to the substructure. The corresponding boundary conditions (yield strength, covering layer thickness, sandwich thickness etc.) are taken into account in the mask for selecting the connection with the substructure.

In the Index "fixings" you can now define hidden fixings - here using an example:
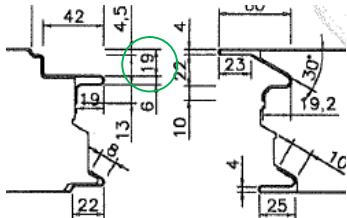
A new type of hidden fixings is created by selecting "+" at the top. This is followed by the definition of this type:

•	variation	designation of type of hidden fixing
•	LSP	with load spreader plate?
•	Interpolation	In the case of a cantilever arm with a length between the end support and the intermediate support, NRvk may be interpolated. Please refer to the "eR" explanations in the table below.
•	el	At what distance is the intermediate support [mm]
•	delta	Reduction of the sandwich thickness due to the hidden fixing (usually approx. 20 mm). Example:
•	washer-diameter	Which wahser diameter is possible? Here as an example: from 16 to 100 mm Note: 0 and 100 mm are only to be regarded as placeholders for fictitious sizes - there is therefore no restriction for the range 0 to 100 mm.
•	fastener-diameter	Which fastener diameter is possible? Here as an example: from 0 to 7 mm Note: 0 and 100 mm are only to be regarded as placeholders for fictitious sizes - there is therefore no restriction for the range 0 to 100 mm.
•	diameter head of fastener	Which diameter of head of fastener is possible? Here as an example: only 12 mm Note: 0 and 100 mm are only to be regarded as placeholders for fictitious sizes - there is therefore no restriction for the range 0 to 100 mm.

	charakteristic	
•	number of fasteners	number of fasteners
•	eR	edge distance in [mm] A distinction must be made here between an end support and an intermediate support (eR >= el). Using the example: - eR = 40 mm -> this is an end support (with a distance of 40 mm) - eR = 500 mm -> this is the intermediate support If the "Interpolation" option is activated and we have a cantilever arm, the resistance value of the concealed attachment between eR and el is interpolated.
•	NRVk	Characteristic value of the hidden fixing in [kN].

Referenc:

All data and boundary conditions must correspond to those of the tests (e.g. according to FprEN 14509-2). The national regulations must be observed if necessary. For Germany, for example, these values are to be regulated within the tests of an German Technical Approval/German Technical Type Approval.

3) Finish creating a new panel

To complete the entry, select the "Add" button.

The mask is closed by selecting the "Cancel" button.

Please note that the newly entered panel may not yet be listed in the sandwich panel selection dialogue. Please select the option "Show my elements" first.

4) Creating a new sandwich panel from a template

It is also possible to modify an existing element. To do this, please mark the corresponding element in the element selection and select the option "New element from template".
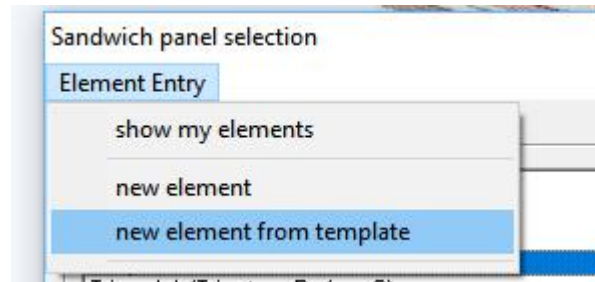
5) Changes to an entered sandwich panel

You can also change the sandwich panels that you have entered. Please select the corresponding panel in the element selection and select the option "Element name - editieren".
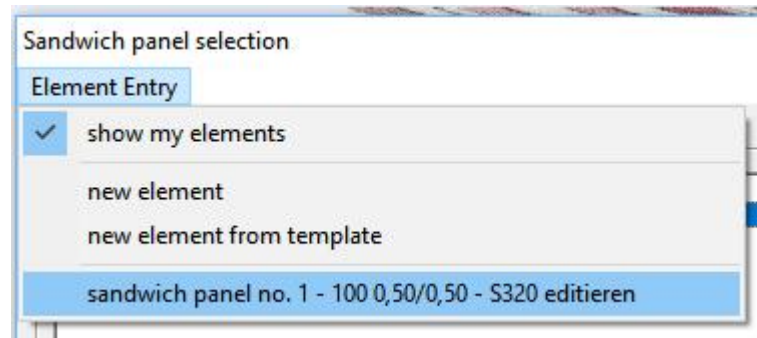
Sandwich panels that are already contained in the SandStat database cannot be edited.