Rev. ARE 02016-02 01/2018

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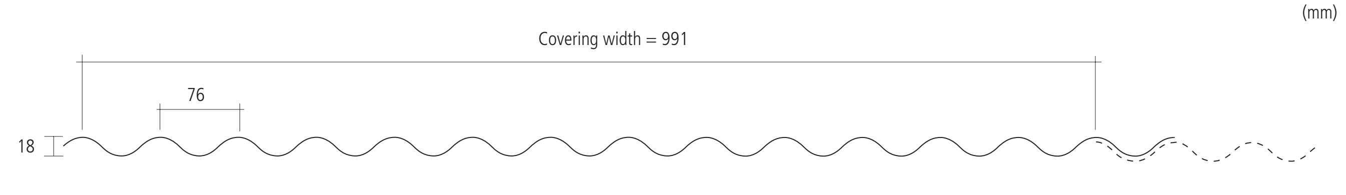
SINUS 18

Steel Construction Sheet
Jan 1997 S 257
Type approval



Cross sectional data – calculated for safety class 1

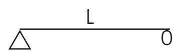
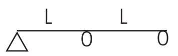
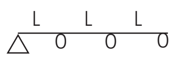
Table 1

Overall	Sheet thickness, nominal	t_{nom}	mm	0,50	0,60
	Sheet thickness in calculation	t_{ber}	mm	0,417	0,509
	Tensile yield stress	f_{ty}	N/mm^2	250	250
	Mass	m	kg/m	4,92	5,90
	Selfweight	g	kN/m^2	0,05	0,06
Intermediate bearer	Bearing resistance l_s = 30 mm	R_d	kN/m	2,70	3,82
	Bearing resistance l_s = 100 mm	R_d	kN/m	4,28	5,97
Narrow flange in compression	Moment narrow flange	M_d	kN/m	0,34	0,43
	Moment of inertia in compression	I_{efd}	$10^4 \cdot mm^4/m$	1,0	1,2
Broad flange in compression	Moment broad flange	M_d	kN/m	0,34	0,43
	Moment of inertia in compression	I_{efd}	$10^4 \cdot mm^4/m$	1,0	1,2

Design

Maximum span l m in safety class 1 and for bearer widths $l_s \geq 30$ mm

Table 2

Bearing combination	Thickness mm	Loading directions	**Wind load = Shape factor μ · Characteristic rate pressure q_k kN/m²**													
			0,4	0,5	0,6	0,7	0,8	0,9	1,0	1,1	1,2	1,3	1,5	2,0	2,5	3,0
	0,50	Inwards	1,8	1,6	1,5	1,5	1,4	1,3	1,3	1,3	1,2	1,2	1,1	1,0	0,8	0,7
		Outwards	1,8	1,6	1,5	1,5	1,4	1,3	1,3	1,3	1,2	1,2	1,1	1,0	0,8	0,7
	0,60	Inwards	1,9	1,7	1,6	1,5	1,5	1,4	1,4	1,3	1,3	1,3	1,2	1,1	1,0	0,9
		Outwards	1,9	1,7	1,6	1,5	1,5	1,4	1,4	1,3	1,3	1,3	1,2	1,1	1,0	0,9
	0,50	Inwards	2,1	1,9	1,7	1,5	1,4	1,3	1,2	1,2	1,1	1,0	1,0	0,8	0,7	0,6
		Outwards	2,3	2,0	1,9	1,7	1,6	1,5	1,4	1,4	1,3	1,3	1,1	0,8	0,7	0,6
	0,60	Inwards	2,5	2,2	2,0	1,8	1,7	1,5	1,5	1,4	1,3	1,2	1,1	1,0	0,8	0,7
		Outwards	2,5	2,3	2,1	1,9	1,8	1,7	1,6	1,5	1,5	1,4	1,3	1,1	0,9	0,8
	0,50	Inwards	2,2	2,0	1,9	1,7	1,6	1,5	1,4	1,3	1,2	1,2	1,1	0,9	0,8	0,6
		Outwards	2,2	2,0	1,9	1,8	1,7	1,7	1,6	1,5	1,5	1,4	1,3	0,9	0,8	0,6
	0,60	Inwards	2,3	2,1	2,0	1,9	1,8	1,7	1,6	1,5	1,5	1,4	1,3	1,1	0,9	0,8
		Outwards	2,3	2,1	2,0	1,9	1,8	1,8	1,7	1,7	1,6	1,6	1,5	1,3	1,1	0,9

Deflection L/300 design

Minimum fastening: End bearer, end overlap — 1 screw in bottom of each profile
Other bearers — 1 skrew in bottom of every third profile

SINUS 18

WALL

Explanations

All data are based on Swedish Board of Housing, Building and Planning design regulations BKR 94 and StBK-N5 with application of the partial coefficient method, whereby the wall plate should be assigned to safety class 1.

Using span tables:
Span tables indicating maximum span plains in safety class 1 for different values of wind loads, different bearer cases, and loading directions. Loading direction inwards concerns wind pushing against the wall and loading direction outwards for wind suction out from the wall.

Initial values of wind load:
Wind load = Shape factor μ · Characteristic rate pressure q_k

Sheet metal on the outer walls designed for wind pressure and suction with **shape factors** as set out in annex A in the Snow and Wind Load manual of Swedish Board of Housing. In a randzon around the building's corners, the outer wall plate should also be designed for for a local wind suction with the shape factor μ **= 1,7** and the width of the randzon is regulated according to figur b in annex A in the Snow and Wind Load manual of Swedish Board of Housing. This load can not be combined with any other load.

The characteristic speed pressure as a function q_k of the building's height to ridge h and terrain type determined according to Swedish Board of Housing, Snow and Wind Load manual.

Note that the partial coefficients, for wind load γ_f = 1,3 in regard to load capacity and γ_f = 1,0 in regard to deformation, are counted in the span tables. Within the blue-coloured area the case is deflection L/300 for conventional wind load design.

Where the span tables are insufficient, the sheeting should be designed in accordance with the conditions set out below.

Dimensioning load case:
Loadbearing capacity $Q_d = 1.3 \cdot \mu \cdot q_k$
Deformation $Q_n = 0.25 \cdot \mu \cdot q_k$

Where μ = shape factor for wind load.
q_k = characteristic values of wind load.

The following conditions must be fulfilled:

Field	$M_f \leq M_d$
Intermediate bearer	$M_s - R_s \cdot l_s/8 \leq M_d$
	$(M_s - R_s \cdot l_s/4)/M_d + 0.64 \cdot R_s/R_d \leq 1.16$
	$R_s \leq R_d$
End bearer	$R_s \leq R_d$ eller $R_d/2$
Deformation	$y \leq L/300$

The dimensioning values for moment M_d and support reaction R_d are according to table 1 in safety class 1 with partial coefficient γ_n = 1.0. In safety class 2 and 3 dimensioning values are divided by 1.1 and 1.2 respectivley.

For end bearers, the design value R_d is the same as for intermediate bearers if the distance from the end of the sheeting to the nearest purlin is greater than 33 mm; otherwise $R_d/2$ applies. For bearers, l_s widths between 30 and 100 mm, R_d is interpolated rectilinearly.