Snow guards

WELAND STÅL AB

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Look out!

A compilation of Weland Stål's experience of snow and ice on roofs. Content of regulations and standards. Which products can be used.

Why have snow guards?

The primary task of snow guards is to keep the snow on the roof so that it does not slip down in an uncontrolled manner, rather the property owner can determine when it is to come down by shovelling it off the roof.

There were previously no regulations regarding snow guards, although since 2008 the Swedish Board of Housing, Building and Planning's Building Regulations stipulate requirements regarding the presence of snow guards on most newly constructed buildings.

Property owners have a significant responsibility for the effects of snow and ice down on the ground. In Swedish law, Public Order Act 1993:1617, Chapter 3. General order and safety, Use of public places, contains the following text.

Actions for the protection of people and property (second and third paragraphs).

3 § Snow and ice that could fall and injure people or damage property in a public place shall without undue delay be removed from roofs, gutters and similar devices. This shall be done in such a way that it does not thereby cause a risk of persons being injured or property being damaged. The responsibility for these actions being taken rests with the owner or another person who, as a result of a right of use agreement or for some other reason, is acting in the owner's place.

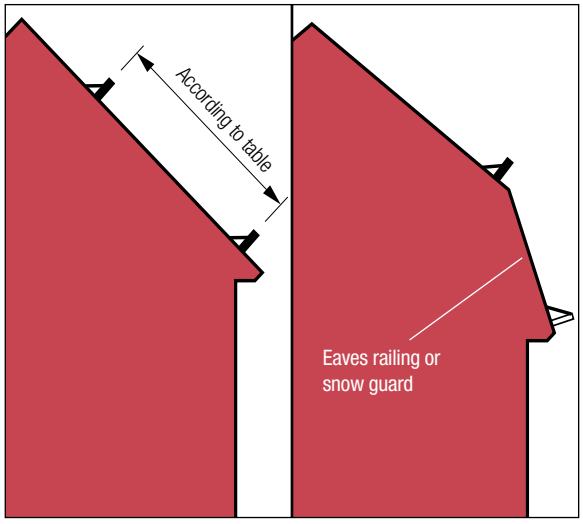
The statute book does not contain anything about snow guards, although in order to live up to the text of the law as a property owner, we recommend the use of snow guards along all exposed facades by pavements, pedestrian zones, parking spaces or play areas. It may also be appropriate to protect projecting items on walls, such as signs and lighting or entrance roofs/balcony roofs to avoid injury or damage.

Snow guards according to quality standard

Weland Stål tests and certifies snow guards according to standard SS 831335, whose stipulations include that they be load-tested with 500 kg of distributed load per metre. The standard contains a table regarding the dimensioning of the snow guards.

In order to read the table, select a row according to roof gradient and combine this row with the column for the relevant snow zone. The value in this field is the maximum distance from the snow guard up to the ridge or the next row of snow guards.

If the length of the roof drop exceeds the lengths in the table, more rows of snow guards should be installed in the first instance; alternatively install the brackets at shorter distances.



The tables are based on fixings c/c 1200 mm. Distance table for snow guards according to SS 83 13 35:2012 with snow zones according to BFS 2015-6-EKS 10 and form factor according to Eurocode SS-EN 1991-1-3. Loads on load-bearing elements – Parts 1-3: General loads – Snow load.

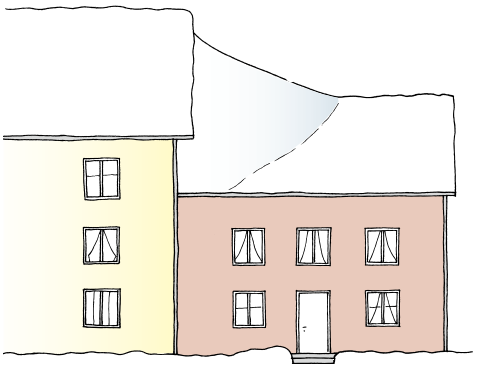
Applies for Pentroofs

Roof gradient a	Snow zone according to the Swedish Board of Housing, Building and Planning's Building Regulations							
	1	1.5	2	2.5	3	3.5	4.5	5.5
6	60	40	30	24	20	17	13	11
10	37	24	18	15	12	10	8.1	6.6
14	27	18	13	11	8.9	7.6	5.9	4.8
18	21	14	11	8.5	7.1	6.1	4.7	3.9
23	17	12	8.7	7.0	5.8	5.0	3.9	3.2
27	16	10	7.7	6.2	5.2	4.4	3.4	2.8
33	14	9.1	6.8	5.5	4.6	3.9	3.0	2.5
38	13	8.6	6.4	5.2	4.3	3.7	2.9	2.3
42	13	8.4	6.3	5.0	4.2	3.6	2.8	2.3
45	13	8.3	6.3	5.0	4.2	3.6	2.8	2.3
50	13	8.5	6.3	5.1	4.2	3.6	2.8	2.3
55	13	8.9	6.7	5.3	4.4	3.8	3.0	2.4

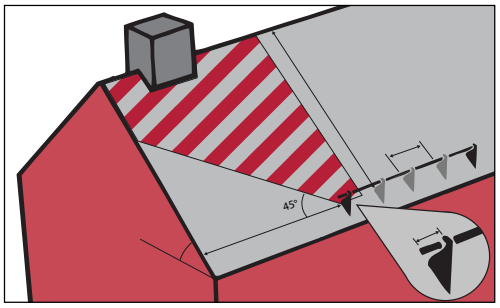
Applies for Saddle Roofs

Roof gradient a	Snow zone according to the Swedish Board of Housing, Building and Planning's Building Regulations							
	1	1.5	2	2.5	3	3.5	4.5	5.5
6	55	36	27	22	18	16	12	10
10	31	21	16	13	10	9.0	7.0	5.7
14	22	14	11	8.6	7.2	6.2	4.8	3.9
18	16	11	8.2	6.5	5.5	4.7	3.6	3.0
23	13	8.4	6.3	5.1	4.2	3.6	2.8	2.3
27	11	7.5	5.6	4.5	3.7	3.2	2.5	2.0
33	10	6.6	5.0	4.0	3.3	2.8	2.2	1.8
38	9.4	6.2	4.7	3.7	3.1	2.7	2.1	1.7
42	9.1	6.1	4.6	3.7	3.0	2.6	2.0	1.7
45	9.1	6.1	4.5	3.6	3.0	2.6	2.0	1.7
50	9.2	6.2	4.6	3.7	3.1	2.6	2.1	1.7
55	10	6.4	4.8	3.9	3.2	2.8	2.1	1.8

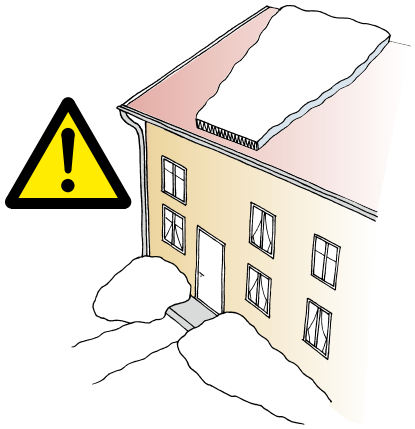
When dimensioning snow guards, it is important to give consideration to "snow pockets" which form where a roof adjoins taller properties or other types of addition that bind more snow at different points on the roof. The direction of the wind and weather conditions where the building is located can also be of importance regarding how much snow is lying on the roof. Only installing short snow guards above doors can create major problems with overloading as this can cause a reverse plough effect.



Calculation of short snow guards
A snow guard that only covers a short part of the length of the building, e.g. over a door, runs a considerable risk of being overloaded.
You can perform calculations easily on our website: www.welandstal.se

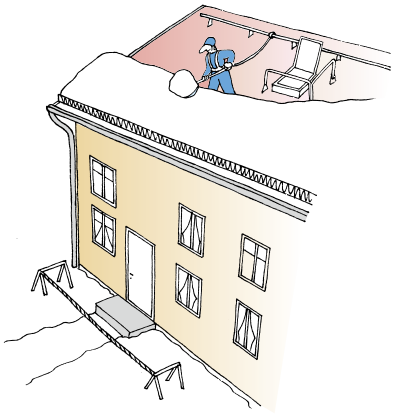


Newly fallen, dry snow weighs 30-100 kg/cubic metre, whereas wet spring snow can weigh 400 kg/cubic metre. More information about snow can be found at http://www.smhi.se/sgn0102/n0205/snofakta.pdf



Shovelling snow

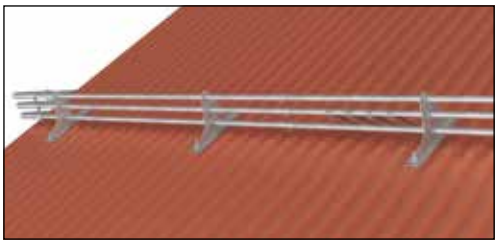
When it comes to shovelling snow, it is the responsibility of the property owner to carry this out as part of the maintenance of the building and to prevent damage to the roof and other installed roof accessories, as well as to prevent snow/ice falling down. In the event of small amounts of snow, the snow can be allowed to remain. However, when the snow cover reaches the upper edge of the railing, you should consider shovelling it off. Many factors govern when shovelling needs to take place. These include the amount of snow, different layers in the snow cover which can cause collapses, weather conditions, the leakage of heat. One reason for shovelling may be to avoid icicles.
When shovelling off the roof, it is important to bear in mind the distribution of the load. In the case of smaller roof drops, you should work from the top down. With large roof drops, it is appropriate to shovel the snow in "strips" in order to avoid a lopsided load.



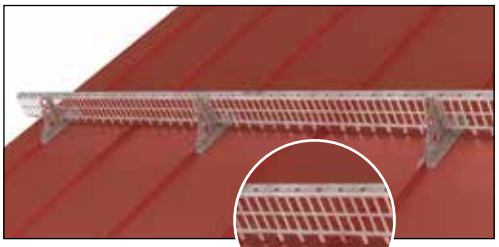
Checklist for shovelling snow

- Draw up a risk analysis and a roof shovelling plan. More information about how and what you should keep in mind can be found on www.taksakerhet.se
- Check roof safety products such as gangways, ridge rails and lifeline mounts to ensure that safe access with a lifeline is possible when shovelling. This check should be performed annually and the fixings, in particular, should be checked in plenty of time before the arrival of winter and snow.
- Cordon off pavements and station guards, if necessary, in order to protect passers-by.
- Notify the snow shovellers of the risks entailed with the work (it is a good idea for them to have been on the roof when there is no snow so that they can orient themselves better on the roof).
- Check that your personal safety equipment is in good working order and safe.
- In the event of large amounts of snow, it is a good idea to shovel off the sides of the roof alternately so that it does not have a lopsided load. For example, if you clear all the snow on one side but still have snow on the other side, the building can sustain damage.
  One solution is to shovel "strips" approximately 2 metres wide and at 2-3 metre intervals.
- Shovel carefully to ensure that the roof, gutters and hoods, etc., are not damaged.

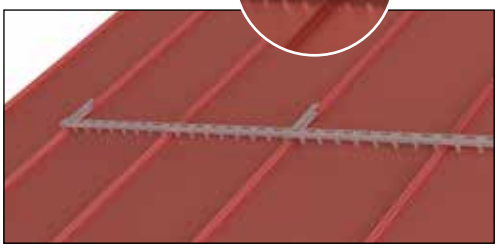
Snow guard products in Weland Stål's range



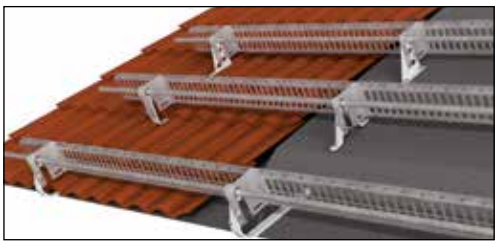
Snow guard with 3 tubes
A stable snow guard that is ideally suited for older roofs where an older appearance is desirable. Also works as an eaves railing. The brackets are installed with c/c max. 1200 mm. The tubes are crimped at one end, which means that the tubes fit into each other and the joints only need to be secured with through bolts. It is also easy to slide the tubes into the brackets. Design in accordance with SS 831335.



Snow guards made from profile grating
Weland Stål's best-selling snow guard, largely due to its light weight and simple installation. Also available with sliding ice stop pins. Also works as an eaves railing.
The brackets are installed with c/c max. 1200 mm. The grating is placed against the mounts and simply joined with through bolts. Design in accordance with SS 831335.



Snow rake
The snow rake is a unique product intended primarily for folded metal roofs. The snow rake does not satisfy the requirements according to SS 831335. However, it is an excellent complement when placed on the roof in several rows, distributing the snow pressure and creating an even snow cover. The snow then thaws with no risk of sheets of ice sliding down from the roof. The rake on its own works well on smaller roof surfaces and at lower roof gradients.



Snow guard attachment
An existing eaves railing can be supplemented with a snow guard attachment for profile grating or grating.
(The picture shows a snow guard made of grating). Fits all types of old brackets. The attachment can also be installed on mount types 2, 4 and 6 without tubes.

Sliding ice products
Weland Stål has developed various specialist products to prevent ice from sliding under traditional snow guards.

Advice on installing snow guards

The standard for snow guards, SS 831335, states that snow guards must be installed as close to the edge as possible. On concrete or clay tile roofs, this often means along the second row of tiles, whereas it is possible to install the guards closer to the edge of most other roofs. In the event of large canopies, it may be better to install the snow guards directly above the wall to ensure that the trusses do not sustain damage, and if necessary to install a second row at the roof edge.
On interrupted roofs, it is most important to install the snow guards at the "breaks" in the roof, and possibly to supplement an additional row on the steep section.
In order to protect various openings in the roof, a short snow guard above these can protect against damage. When short sections are installed above entrances, it is important to remember that the snow will build up diagonally, so you are basically creating a snow pocket. More rows or more closely spaced brackets can allow this to work well, but remember that the dimensioning table is based on the snow guards being situated along the entire eaves so that all the brackets are subjected to the same pressure.

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