



# WIND AND SNOW LOADS

# HOW WELL CAN YOUR **SHELTER** WITHSTAND WIND AND SNOW?

A shelter must be reliable. Especially in strong winds or snowfall. In some situations, you also need to demonstrate what loads a structure can withstand, for example during a permit process.

For shelters and tent structures, wind and snow loads are often referenced. In the Netherlands, buildings are typically calculated with a snow load of approximately 0.70 kN per m<sup>2</sup>. In Germany, different wind and snow zones are used. These standards are designed for permanent buildings.

Shelters and tent structures are usually not designed in the same way. That does not mean they are less safe. It does mean you need to understand what loads they can withstand and under which conditions they are used.

That is why it is important to understand which forces act on a shelter and how these are calculated. In this [blog](#), we explain how wind and snow loads work, how to assess your situation and how this is reflected in the buildbook of a Kroftman shelter.



Watch the  
explainer  
video online  
[kroftman.com](https://kroftman.com)



# ANSWER TO YOUR QUESTION IN ADVANCE

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Our shelters are calculated for different levels of wind and snow loads. This depends on the model you choose.

- Snow load capacity: between 0.2 and 0.5 kN/m<sup>2</sup>
- Wind load capacity: between 0.3 and 0.665 kN/m<sup>2</sup>

The structures are calculated according to the European standard EN13782. Combined wind and snow loads are taken into account. This way, you know in advance what loads a structure can withstand.

# 01

## WIND AND SNOW LOADS: THE BASICS

Why are wind and snow loads important? Wind load is the force exerted by wind on a structure. At high wind speeds, this force can increase significantly. If a structure is not designed for this, damage can occur.

Snow load refers to the weight of snow that remains on the roof. Wet snow in particular can become heavy. If the weight becomes too great, a roof structure can become overloaded.

The load on a shelter mainly depends on three factors:

- the height of the shelter
- the surroundings
- the region or climate

The higher a shelter is positioned and the more open the surroundings, the greater the wind load. Snow load varies by region. In some areas, there is hardly any snow, while in others, thick layers of snow regularly occur.

Our shelters are calculated according to the European standard EN13782. Wind and snow loads are expressed in kilonewtons per square meter, kN per m<sup>2</sup>.

In the buildbook of a shelter, you can therefore see exactly:

- the maximum wind load
- the maximum snow load

This clearly defines what load the structure can withstand.

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# 02

## WHY LOOKING AT ZONES ALONE IS NOT ENOUGH

In many countries, maps exist that show wind and snow zones. Such a map indicates the snow load that applies to a specific region. Based on such a map, it may seem that a shelter is not feasible. For example, because the standard value of a structure is lower than the required value for that region.

In practice, the situation is often more nuanced.

The actual conditions on site also play a role. Consider, for example:

- shelter from buildings or trees
- location outside mountainous areas
- the actual amount of snowfall
- the period of use and duration of installation

It is therefore quite common that a shelter is perfectly suitable in practice, while a zone map shows a higher theoretical value.

That is why it is important not to look only at the zone, but also at the specific conditions at your location.

A shelter that is installed temporarily or used only during a certain season will not be exposed to all extreme conditions. As a result, the actual load is often lower than the theoretical standard value.

# 03

## HOW DO YOU ASSESS THE ACTUAL SNOW LOAD?

To assess the actual load, you combine the standard value in kN per m<sup>2</sup> with what is actually present on the roof.

### STEP 1 UNDERSTAND THE STANDARD VALUE

In the Netherlands, a ground snow load of approximately 0.7 kN per m<sup>2</sup> is commonly used. This corresponds to about 70 kilograms of snow per square meter.

Not all of this weight ends up directly on the roof. When calculating roofs, a shape factor is therefore applied. This factor takes into account the type of roof and how snow accumulates on it.

For a flat or nearly flat roof, the design value often comes to around 0.56 kN per m<sup>2</sup>.

Exact values may differ per country, but the principle remains the same. For each location, there is a standard value indicating the snow load a structure must be able to withstand.

### STEP 2 LOOK AT THE SNOW ON THE ROOF

The thickness and type of snow determine how much weight is on the roof.

As a general indication:

- 10 cm of compact snow weighs approximately 20 to 25 kg per m<sup>2</sup>
- 20 to 30 cm of compact snow approaches many design values for lightweight structures

Pay particular attention to situations where the load can be locally higher:

- snow accumulation near edges, walls or obstacles
- snow ridges or accumulation caused by wind
- wet snow or ice, which are much heavier than dry snow

### STEP 3 COMPARE THE SITUATION WITH THE STRUCTURAL VALUE

The buildbook of a shelter states the maximum snow load used in the design, for example 0.50 kN per m<sup>2</sup>.

In practice, a shelter often remains well within this design value. A uniform layer of snow generally does not pose a problem for a

structure designed according to the standard. A layer of up to approximately twenty centimeters of regular snow is often still within typical design values.

However, pay attention to situations where the load may become locally higher, for example due to accumulation or heavier snow.

If you notice that the snow layer is approaching the design limit or is accumulating heavily in certain areas, it is advisable to remove the snow in time, especially in places where the load is highest.



# 04

## SNOW LOAD IN A PERMIT PROCESS

Whether you need a permit for a container shelter depends on local regulations. This varies by country, region and municipality.

During a permit process, the structural safety of the shelter is often assessed. Wind and snow loads play an important role in this. Authorities want to be able to verify that the structure can safely withstand these loads.

That is why we supply a buildbook with our shelters. This includes, among other things, construction drawings, calculations according to EN13782 and the maximum wind and snow loads in kN per m<sup>2</sup>. This documentation is often used in a permit application or when a municipality requests additional information.



# 05

## OVERVIEW OF WIND AND SNOW LOADS OF SHELTERS

The maximum wind and snow loads differ per model. This depends, among other things, on the width, the roof type and the structure.

In the overview below, you can see the calculated values per product group.

Product group	Type	Width	Roof type	Max. snow load	Max. wind load
Workbox	WB4	4	Flat roof	0,40 kN/m <sup>2</sup>	0,50 kN/m <sup>2</sup>
Workbox	WB6	6	Flat roof	0,50 kN/m <sup>2</sup>	0,50 kN/m <sup>2</sup>
Container shelter	CTS4	4	Saddle roof	0,30 kN/m <sup>2</sup>	0,50 kN/m <sup>2</sup>
Container shelter	CTS6	6	Saddle roof	0,30 kN/m <sup>2</sup>	0,30 kN/m <sup>2</sup>
Container shelter	CTS8	8	Saddle roof	0,30 kN/m <sup>2</sup>	0,30 kN/m <sup>2</sup>
Container and bunker silo shelter	CTA8	8	Arch roof	0,30 kN/m <sup>2</sup>	0,50 kN/m <sup>2</sup>
Container shelter	CTS10	10	Saddle roof	0,25 kN/m <sup>2</sup>	0,30 kN/m <sup>2</sup>
Container and bunker silo shelter	CTA10	10	Arch roof	0,30 kN/m <sup>2</sup>	0,50 kN/m <sup>2</sup>
Container shelter	CTA10 HD	10	Arch roof	0,50 kN/m <sup>2</sup>	0,665 kN/m <sup>2</sup>
Container and bunker silo shelter	CTA12	12	Saddle roof	0,20 kN/m <sup>2</sup>	0,50 kN/m <sup>2</sup>
Container and bunker silo shelter	CTA12	12	Arch roof	0,30 kN/m <sup>2</sup>	0,50 kN/m <sup>2</sup>
Container and bunker silo shelter	CTA15	15	Saddle roof	0,20 kN/m <sup>2</sup>	0,50 kN/m <sup>2</sup>
Container and bunker silo shelter	CTA15	15	Arch roof	0,25 kN/m <sup>2</sup>	0,50 kN/m <sup>2</sup>

# 06

## NEED A SHELTER WITH HIGHER WIND OR SNOW LOAD CAPACITY?

Sometimes a location requires a heavier structure. For example, on an open site, at greater height or due to stricter requirements from a permit process.

In that case, we can also supply a reinforced container shelter or a steel shelter that is calculated for higher wind and snow loads.

Not sure if your situation fits within the standard options? Feel free to get in touch. We are happy to look at the possibilities with you. Want to learn more about a custom solution? We explain the steps in [this blog](#).

## NEED ADVICE?

Our product specialists are happy to help you choose the right solution for your situation.

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