

**USER MANUAL**

# Lifting tool for load-bearing sheet

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**Rautaruukki Oyj**

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## Description and intended use

The present lifting tool is meant for lifting Ruukki's load-bearing corrugated sheets. You can lift sheets one by one or lift several sheets in a bundle. Profile bundles must be separated with underlay rails, the height of which must be at least 70 mm allowing the lifting tool to be placed under the bundles.

The lifting tool consists of two separate sub-assemblies and a connecting lifting belt. The assemblies of the lifting tool are placed at both ends of the sheet load (Figure 1). The chain thread used for lifting is not a part of the lifting tool.

## CE-marking

The present lifting tool is CE-marked according to the Machinery Directive 2006/42/EU of the European Parliament and Council of Europe; a respective conformity certificate is drawn to verify this. The CE-marking plate is located on the leveller of the lifting tool and includes information as follows:

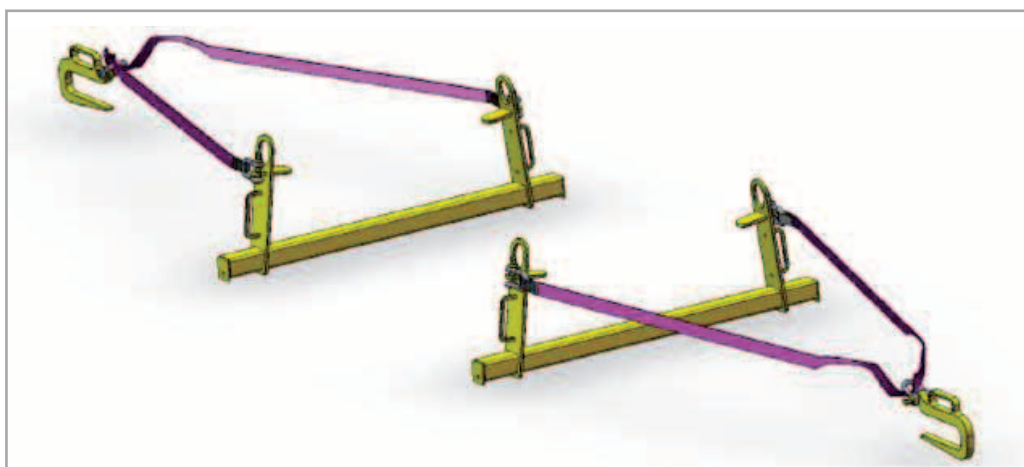


Figure 1 Parts of the lifting tool without load and chain thread

### CE-marking

Table 1

Manufacturer	Innosteel Factory Oy
Maximum allowed lifting load	1500 kg
Model number	09201000
Production year	2009
CE-marking	CE

## Lifting capacity

The maximum nominal working load limit WLL (=Working Load Limit) of the lifting tool is 1500 kg. Additionally, it must be considered, that the lifting tool is designed for lifting Ruukki's load-bearing corrugated sheets only. Overloading the lifting tool is strictly forbidden.

## Parts

The lifting tool consists of two separate sub-assemblies, lifting belts and shackles. The beam hoist parts are described in drawings 2-5.



Figure 2 Hook part of the lifting tool (tpc / end-assembly)

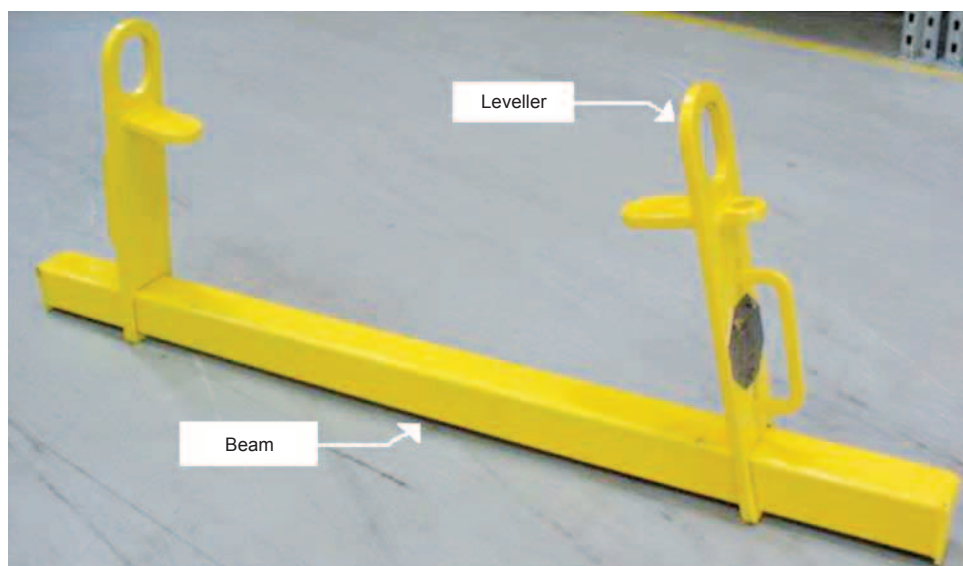


Figure 3 The lifting part of the lifting tool with a beam part (1 pc / end-assembly) and leveller (2 pcs / end-assembly)



Figure 4 Lifting shackle (3 pcs / end-assembly)



Figure 5 Lifting belt (1 pc / end-assembly)

## Load features

The sheet bundle to be lifted should not be higher than 215 mm (figure 6). The number of sheets can vary depending on the different profiles and the strength of the material. The most important features of the bundle size are the nominal load capacity of 1500 kg and the maximum allowed height of the bundle of 215 mm. Only one sheet bundle can be lifted with the lifting tool at a time.

## Making the lift

Before lifting, check visually that all of the lifting tool parts are in working order and mounted according to the instructions. The parts must be checked visually for wear, possible deformation or damages, which might reduce the safety of usage and lifting. Lifting belts used with the lifting tool must be of the same size in both ends so the load is balanced. All lifts and down hauling must be done by accelerating and cutting speed slowly. Any kind of twitches during a lift are to be avoided.

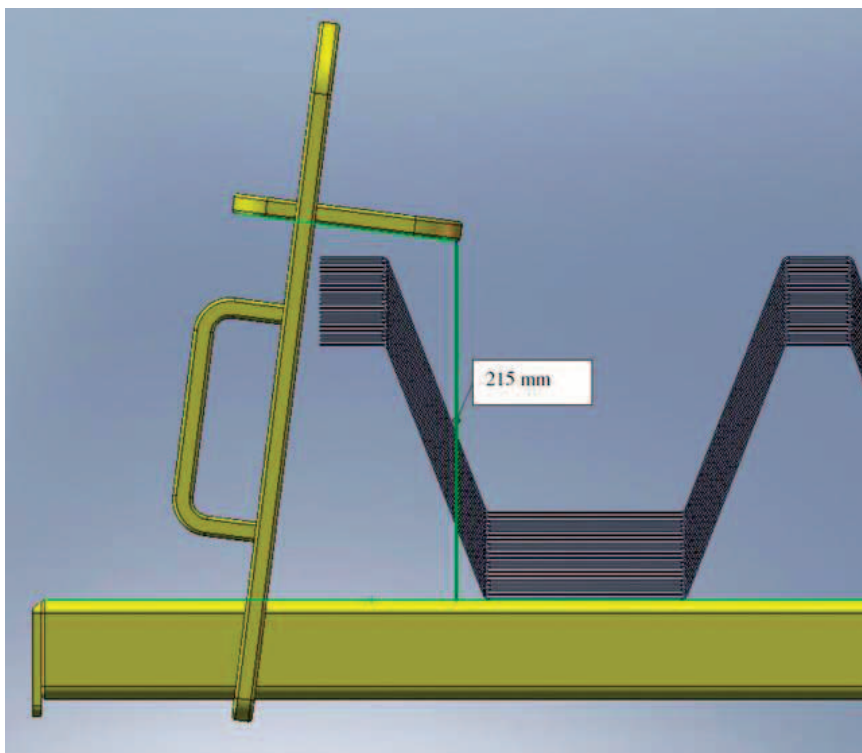


Figure 6 Maximum allowed load height

## Preparing a lift

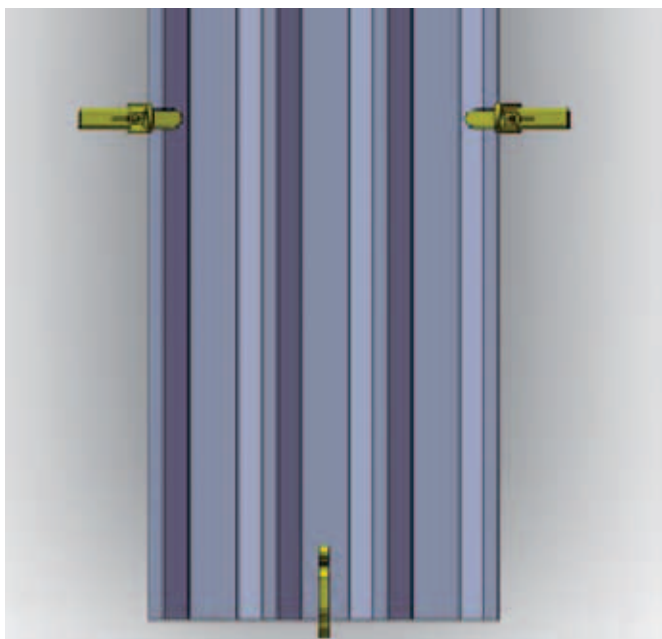


Figure 7 Placing the parts of the lifting tool beneath the load

For starting a lift, the lifting tool parts should be placed beneath the sheet bundle according to figure 7.



Figure 8 Placing the hook on the load

The hook-part of the lifting tool should be placed at the end of the sheet bundle, as close to the centre as possible. The positioning of the hook on the sheet bundle is described in figure 8.



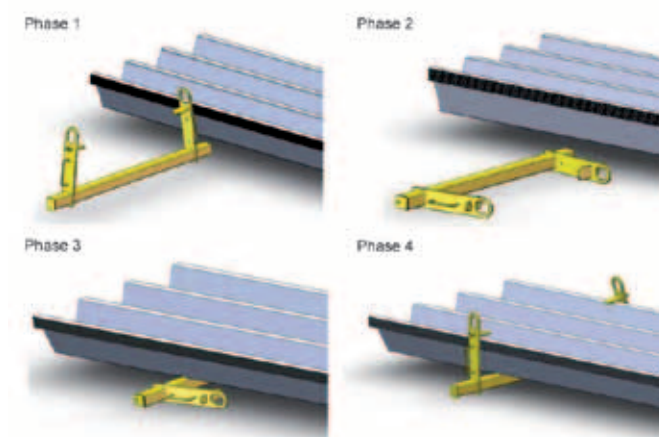


Figure 9 Moving the entire beam under the load

The beam part of the lifting tool must be placed beneath the sheet bundle so the bundle is in the middle of the beam. The beam can be placed beneath the bundle by bringing it down completely, moving it under the bundle and lifting it up to its place again (figure 9).



The part of end going over the beam's edge away from the load aka downwards

Figure 10 The harnesses at the end of the beam show in which direction the beam must be located for lifting

Or by detaching one or both slab parts, moving the beam under the bundle and mounting the beam part (figure 11). The end harnesses of the beam part show in which direction the beam must be placed under the load (figure 10).



Figure 11 Placing the beam part under the load in parts





Figure 12 The levellers must be pushed as close to the load as possible

The levellers must be located as close as possible to the edges of the sheet bundle so the load is positioned firmly between the lifting points.



Figure 13 Fastening of a lifting shackle to the hook

The shackles must be placed in their correct locations as shown on figures 13 and 14.

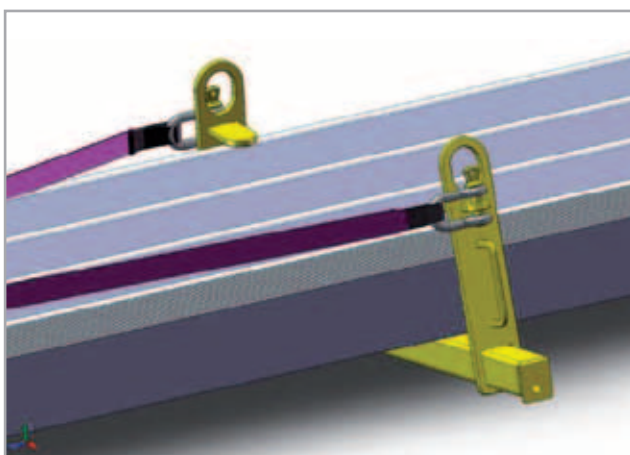


Figure 14 Fastening of a lifting shackle to the leveller

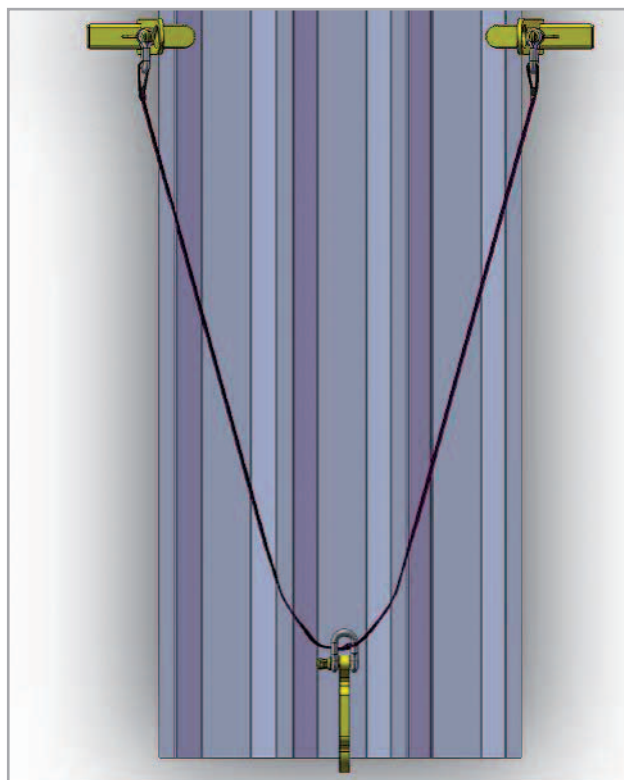
After attaching the shackles, the ends of the lifting tool must be connected to each other with shackles and a lifting belt (figures 15, 16, 17). The lifting belt is threaded through the lifting shackles and the ends are attached to the lifting shackles of the levellers.



**Figure 15** Fixing the lifting belt to the lifting shackles



**Figure 16** The ends of the lifting belt are attached to the shackles of the leveller



**Figure 17** The other end of the mounted lifting tool together with the load seen from above

The beam part of the lifting tool must be moved towards the centre of the load so that the lifting belt is as tight as possible before lifting.

## Lifting the load

When the parts of the lifting tool are correctly mounted on both sides of the load, lifting can be started with the chain threads according to figure 18.

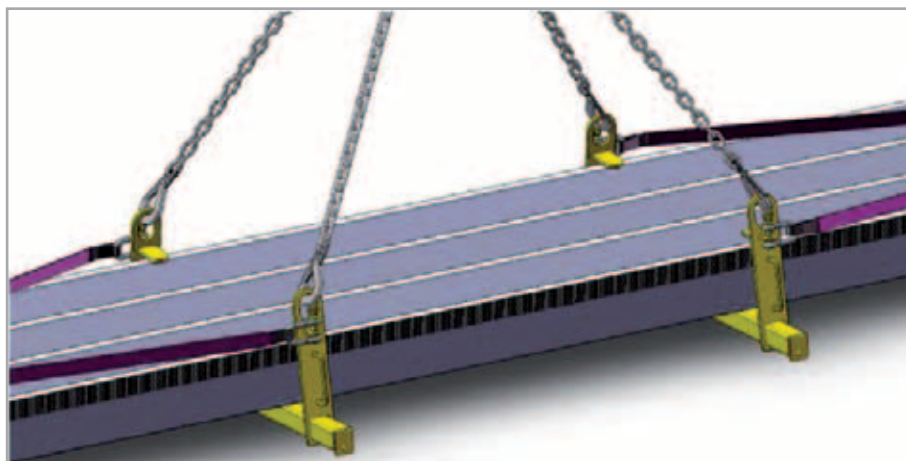
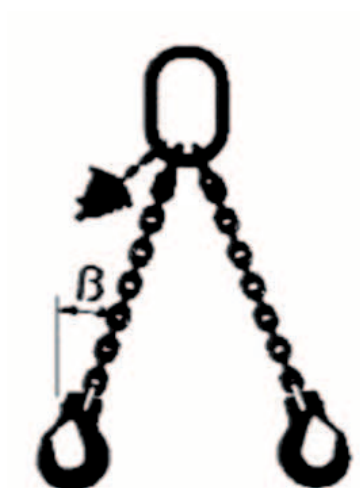


Figure 18 Mounting of the chain threads and lifting lines on the lifting tool



$\beta$  = maximum allowed inclination =  $60^\circ$

Figure 19 Maximum allowed inclination of the chain threads when lifting

The maximum allowed inclination of the chain threads is 60 degrees (figure 19). Inclination can be adjusted if necessary by adjusting the length of the lifting belts of the lifting tool towards the load and the chain thread length.

Lifting points and angles are described on figure 20. The maximum allowed inclination of the chain thread is 60 degrees and the minimum allowed inclination is 10 degrees. The second determining factor of the lifting points is the lengthwise division of the load towards the parts of the lifting tool. The maximum distance of the lifting part from the load determined by the length of the lifting belts is one third of the length of the load. The distance between the lifting parts must be at least one third of the load length.

#### Maximum lifting length of profile.

Table 2

Profiili	Lmax /mm	tmin
T45-30L-905	15.000	0.6mm
T70-57L-846	15.000	0.6mm
T70-57L-1058	15.000	0.6mm
T120-63L-695	18.300	0.7mm
T130-75L-930	18.300	0.7mm
T153-40L-840	18.300	0.7mm

Lmax = maximum profile length

tmin = minimum material thickness

steel type S350GD+Z

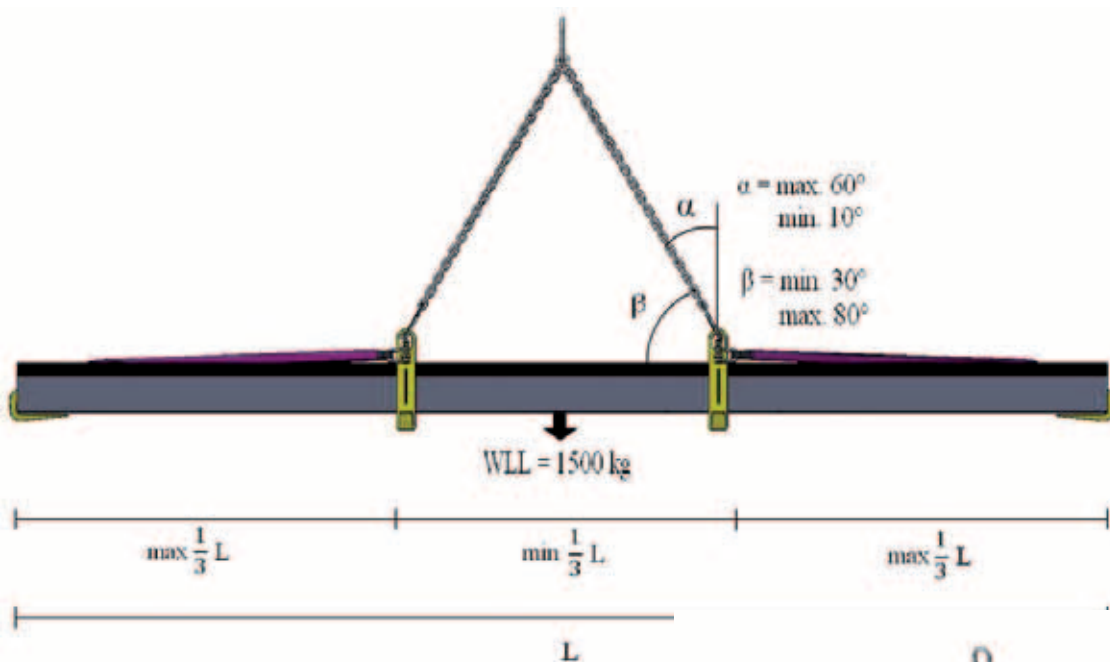


Figure 20 Lifting points and angles of the lifting tool

Before starting the lift, make sure that all parts are fixed according to the instructions and that the shackles are tightly closed. When all parts of the lifting tool are positioned and the chain thread mounted, the whole mounting will look like shown on figure 21.

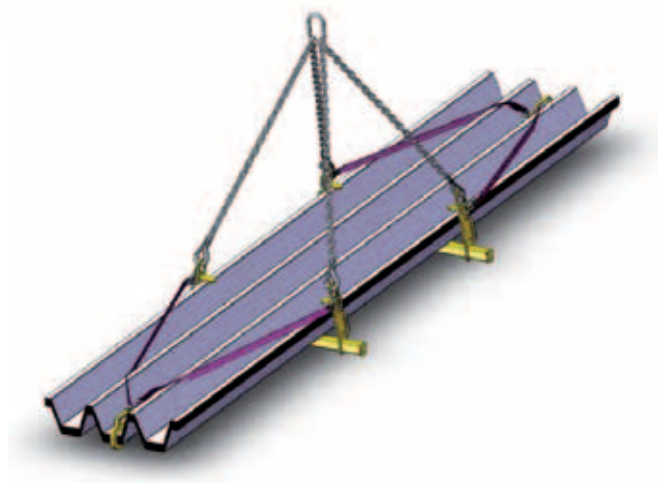


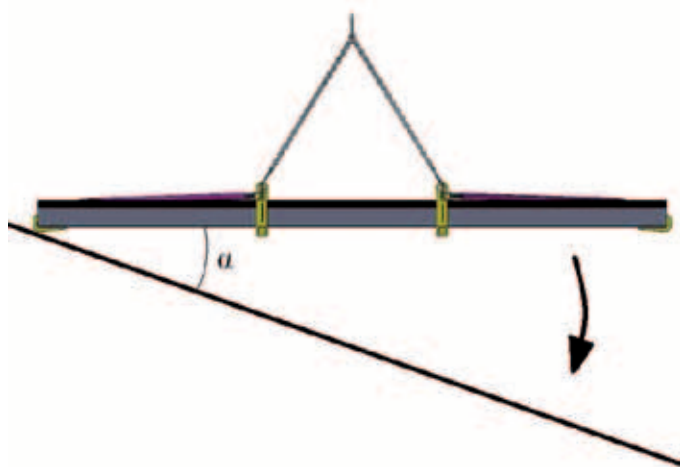
Figure 21 Mounted lifting tool with load and chain threads

It is advised to mainly lift profile sheets of the same length with the lifting tool. It is also possible to lift the same type profile sheets of different lengths when positioning the shorter sheets between the longer ones. This means that the top and bottom sheets are the longest sheets and of identical measures. If the shortest sheets are clearly shorter than the longest ones, the balance of the whole load must be considered. The short sheets must be placed so that the load is divided evenly over the total length of the load. It is also possible to lift shorter sheets of the same profile in the bundle, but in such cases the shorter sheets must be tied to the load with, for instance, load belts so they will not drop due to wind or inclination during hauling.

## Hauling of the load

The load must always be hauled onto the bottom beams and a solid surface so the lifting tool can be removed from beneath the load. This is done by cutting the speed slowly and gently. If necessary, the load can also be hauled onto an inclined surface with a maximum inclination of 25 degrees (figure 22).

If there is a clear difference in length of the profile sheets in the bundle, the load cannot be hauled onto an inclined surface. Lowering different-sized profile sheets onto an inclined surface may result in the shorter sheets slipping, dropping and damaging the other sheets.



**Figure 22** The load can also be hauled onto an inclined surface. Maximum allowed inclination  $\alpha = 25^\circ$

## Handling and storage

The usage of broken or damaged lifting tool parts is strictly forbidden and they must be replaced. The lifting tool parts must be handled carefully so unnecessary blows are avoided. Under no circumstances should the parts be used for other purposes than the intended. The lifting tool parts must all be stored in the same location with no exposure to chemicals, solvents, ultraviolet radiation, temperatures exceeding 70 °C or weather alterations.

## Maintenance and inspections

The lifting tool parts must be kept clean so possible cracks, breaks and deformations of the parts can be detected. Before each lift it must be visually checked that the parts are not worn, deformed or otherwise damaged in a way that may reduce the working and lifting safety.

Usage of damaged or broken parts for lifting is strictly forbidden. Repairing of damaged parts, for instance, by welding is also forbidden – the damaged parts must be replaced with new respective parts.

## Usage limitations

Standing below the lifted load is strictly forbidden. The lifting tool can not be used for lifting persons. The lifting tool can be used within the temperature range of -40 - +40 °C. However, the individual temperature requirements of the used lifting belt must be observed and followed precisely. There should be no excessive parts on the lifted load during lifting as the equipment is meant only for lifting load-bearing corrugated sheets.

### The lifting tool must be taken out of use if:

- The marking of maximum allowed load is unreadable or missing
- The lifting tool has been overloaded
- A part of the lifting tool is deformed, cracked or broken

### The lifting belt must be replaced with an identical one if:

- The marking of maximum allowed load is unreadable or missing
- The lifting belt has been overloaded
- There is a knot on the belt
- There are excessive friction damages on the belt or the belt is generally worn and dirty
- There are friction or cutting damages on the belt

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