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# Lashing

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## SpanSet Truxafe

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Directions for use

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## GB TruXafe Instructions for use

### Introduction

Dear Customer,

We congratulate you on your purchase of TruXafe. You have chosen a quality product by SpanSet, which will be very useful to you for securing loads on curtainsiders and which has a long useful life where used appropriately. These instructions for use will provide you with information on the correct use of TruXafe and refer you to the applicable standards and laws. Please read the instructions for use fully before using for the first time! Should you have additional questions, please consult SpanSet directly or the SpanSet specialist, from whom you purchased TruXafe.

When installing the TruXafe side slats yourself, please refer to the assembly instructions, which are also on the CD-ROM.

The combination of the individual TruXafe components is dependent on the rigidity of the vehicle superstructure and the load to be transported. We would be pleased to provide you with specific recommendations based on the attached questionnaire. Simply send the completed questionnaire directly to SpanSet or to your SpanSet specialist.

### TruXafe allows you to...

- ... transport a variety of different loads with your vehicle taking the valid load securing regulations into account. Load securing with TruXafe is in accordance with state of the art technology.
- ... secure your load by form fitting loading using only special side slats and parallel locking beams. A tested side curtain for the vehicle superstructure is unnecessary.
- ... load your vehicle quickly and efficiently.
- ... improve your vehicle handling significantly and make it more controllable by the driver in critical situations.

Your  
SpanSet Company group

## Structure of the instructions for use:

1. Laws, standards and technical instructions for securing loads
2. Components of the TruXafe system
3. Selecting and ordering TruXafe components
4. Instructions for the use of the TruXafe side slats and the stanchion batten pockets
5. Lateral load tolerance when using TruXafe side slats
6. Instructions on the use of the TruXafe locking beam
7. Instructions for the use of the TruXafe locking beam in combination with diagonal tension straps
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9. Storing the TruXafe locking beam
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## 1. Laws, standards and technical instructions for securing loads

§ 22 StVO (German road traffic regulations) is of fundamental importance for the securing of loads in Germany. According to § 22 STVO the load including the equipment for securing loads must be stowed and secured in such a way that they cannot slip, fall over, roll back and forth, fall off or cause avoidable noise even during an emergency braking or sudden avoiding manoeuvre. The recognised technical regulations must be observed.

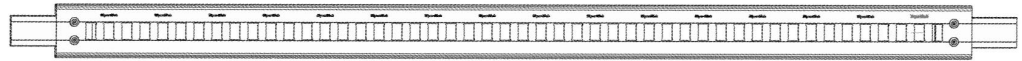
**Recognised technical regulations are:** ISO, DIN EN, DIN, VDI guidelines, expertises by instituted such as DEKRA, TÜV or the professional association for vehicle maintenance (BGF). A selection of applicable standards, guidelines and laws is contained in Appendix (E).

Registered vehicle owners and loaders are obliged to use and load vehicles, which comply with valid laws and up to date technology.

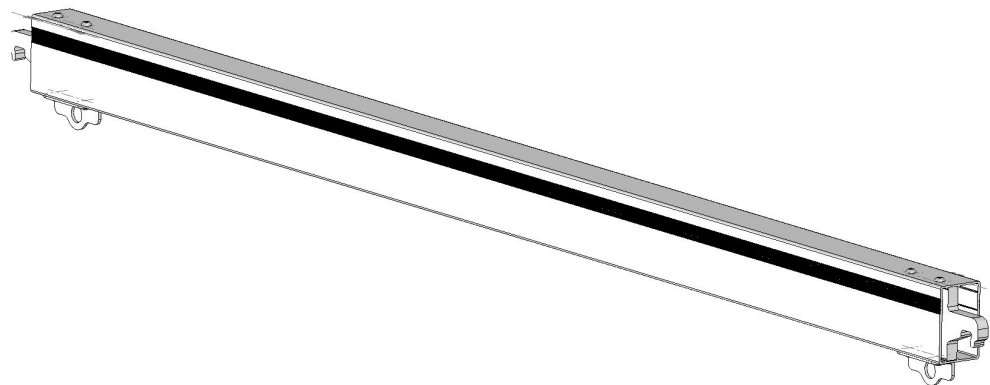
## 2. Components of the TruXafe system

TruXafe comprises the following components:

1 TruXafe side slats

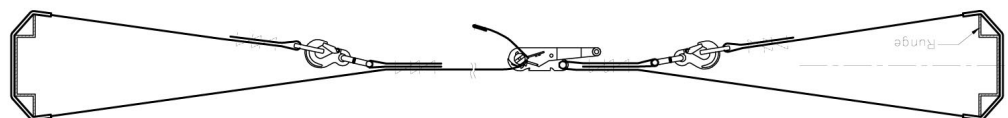


2 TruXafe locking beams



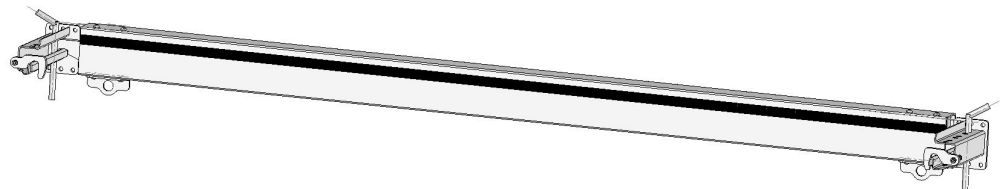
3 Tension straps for the diagonal lashing of the TruXafe locking beam

4 TruXafe-Pro



5 Tension straps for absorbing longitudinal forces

6 Transport facility for four TruXafe locking beams



It is not absolutely necessary to use all of the TruXafe components. The combination and the number of required TruXafe components depends to a great extent upon the rigidity of the vehicle superstructure and the load to be transported.

## GB 3. Selecting and ordering TruXafe components

Your vehicle superstructure will be classified for selecting the required TruXafe components. For this purpose please use the questionnaire specially developed for this purpose by SpanSet. Fully complete the questionnaire, where necessary consulting the vehicle manufacturer.

Based on your information our applications engineers or an authorised SpanSet works agent will determine the combination and number of TruXafe components for your specific area of application (vehicle type and loads).

## 4. Instructions for the use of the TruXafe side slats and the stanchion batten pockets

In today's normal articulated lorries with a load length of approx. 13.6 m and 3 pairs of centre stanchions the batten length between these stanchions is approx. 3.2 m.

The TruXafe side slats have above average bending strength. The side slats are made of aluminium and have a cross section of 36 x 175 mm.

A TruXafe side slat with a bracing length of approx. 3.15 m can be loaded evenly with up to 810 daN (kg). This is equivalent to a load per metre of 253 daN (kg).

The maximum permitted loading reduces for longer slat lengths (A2). On the other hand the permitted maximum loading increases for shorter slat lengths. The permitted loadings change in a linear manner according to the relevant slat length.

In Appendix (E) you will find a comparison of the bending strengths of TruXafe side slats with other commonly used side slats.

The strengthened TruXafe side slats are inserted into the stanchion pockets from the top in the same way as you have previously used your side slats. The flat sides of the TruXafe side slats must face towards the inside of the loading area.

Since the side slats can withstand a high loading, the pockets on the stanchions as well as the stanchions themselves will also be loaded more heavily. The pockets on the stanchions must each be welded on over a total flawless weld seam length of at least 35 mm. In case of doubt the vehicle or stanchion manufacturer respectively should be consulted as to whether the slat pocket can withstand a horizontal pressure outwards of at least 1,000 daN. Where the required weld seam is too short, it can be lengthened by rewelding. Riveted slat pockets must be designed to bear the same load. In case of doubt a confirmation regarding the strengths should be agreed with the vehicle or stanchion manufacturer respectively.

## 5. Lateral load tolerance when using TruXafe side slats

Although the internal vehicle width is normally 2,480 mm, the width of two or three Euro pallets respectively with a total calculated width of 2,400 mm is often used for calculation. A loading space of up to 80 mm remains, within which the load can slip.

Insofar as the cargo is suitable for this and an allowance of approx. 10% is included in calculating the loading on the side slat, this individual case is permissible. As a result the loading units will knock against each other and against the side limits of the superstructure, which is why the suitability of the cargo must be confirmed by the loader or the manufacturer.

The cargo must always be loaded without allowing a loading tolerance (form fitting) in the longitudinal direction of the vehicle, beginning at the bulkhead wall. This also applies where the TruXafe locking beam is installed at the front.

Whole cargos such as laminated sheets, coils or other large format cargos may only be loaded using TruXafe without longitudinal or lateral loading gaps.

## 6. Instructions on the use of the TruXafe locking beam

A TruXafe locking beam with a cross section of 80 x 127 mm and a bracing length of approx. 2,480 mm (vehicle loading width) can be evenly loaded with 2500 daN.

The beam width of 127 mm braces the cargo. The lateral hooking points for the TruXafe locking beam are mounted rigidly on the beam profile so that the whole of the TruXafe locking beam constitutes a single constructional unit.

The TruXafe locking beam fulfills the following functions:

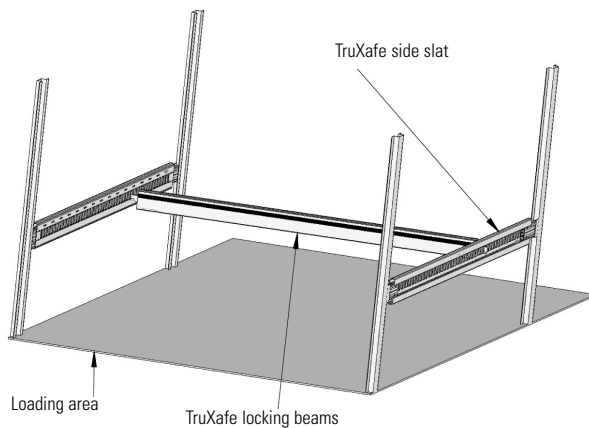
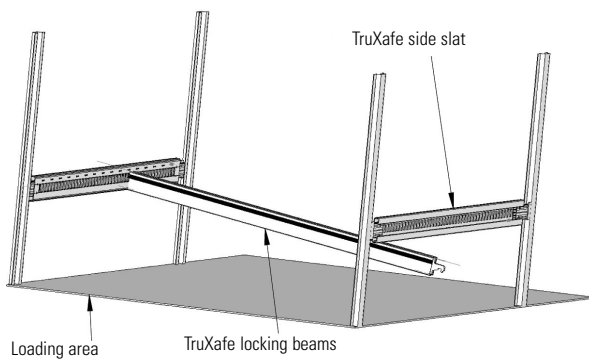
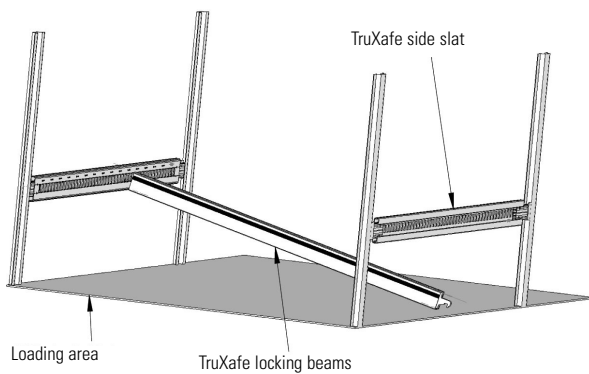
- The formation of individual cargo sections, required for bulkheads, which are too weak and for pressure sensitive cargos.
- Barrier as the rear load restraint for a cargo section.
- Creation of a set back secondary bulkhead in order to maintain the permitted axle weights (load distribution plan).
- Mechanical connection between the right and left vehicle side walls so that the opposite unstressed vehicle wall (e.g. when cornering) assists in supporting the stressed wall.

Please position the locking beams as follows:

Lay the locking beam on the cargo floor of your vehicle at right angles to the direction of travel. Lift one end on the locking beam up to the level of the strengthened TruXafe side slat. Now push the locking lug of the locking beam into one of the right angled holes, which cover the whole length of the strengthened TruXafe side slat at 60 mm intervals. The locking lug must be pushed as far as possible into the strengthened TruXafe side slat. Now lift the other end of the locking beam up. Push the second locking lug of the locking beam into the hole of the strengthened TruXafe side slat. make sure that the locking beam is at right angles to the strengthened TruXafe side slats.

By means of the recesses in the locking lugs, the locking beam should now have positioned itself in the strengthened TruXafe side slats at right angles to the direction of travel. Please make sure you verify that locking has taken place. Since the locking lugs are not positioned in the centre of the locking beam, they can influence the position of the locking beam within the same hole by means of a 180° turn of the locking beam around its vertical centre axis. The resulting length span is 30 mm. This allows an even more specific adjustment of the locking beam to the rear of your cargo.

Of course you can also use several locking beams above each other in order to form cargo blocks. This is dependent upon a sufficient number of TruXafe-side slats being available.



## 7. Instructions for the use of TruXafe locking beam in combination with diagonal tension straps **GB**

The locking beam described in paragraph (6) has one lashing eye each on the right and left side. These lashing eyes can be used to attach two tension straps diagonally to the outer frame of the cargo area and be pre-tensioned to approx. 200 daN.

The advantages of such strap tensioning are:

- The loading capacity of the side wall of the vehicle superstructure is increased significantly.
- The superstructure becomes more torsion resistant. The handling of the entire vehicle is significantly improved. In critical driving situations the driver can control his vehicle much better. This also applies to superstructures, which have been tested according to DIN EN 12642 Code XL!
- Using this strap tensioning even untested vehicle superstructures and mountings fulfill the requirements of § 22 StVO according to DIN EN 12642 Code L!
- The full height doors commonly used today are protected, thus increasing the service life of the rear door components.
- The structural components of the sliding roof are subjected to less stress because of less torsion in the superstructure, which considerably increases service life.

The fixed end of the tension strap is equipped with a claw hook. This claw hook is hooked into the 30 mm lashing eye of the locking beam. To protect the cargo the claw hook should be located with its claw facing towards the bulkhead wall so that soft packaging is not pressed into the point of the hook when braking.





According to the type of vehicle the loose end of the strap can be supplied with a rave hook or a claw hook respectively. The prerequisite for the optimal use of the TruXafe locking beam with diagonal tension straps is that the tension strap can be hooked into almost any longitudinal point in the external frame of the vehicle. A claw hook on the loose end is required where the external vehicle frame is equipped with a so-called multi-hole facility, into which the claw hook can be hooked. Should the vehicle manufacturer prescribe specialised hooks rather than claw hooks, please order them specially.

There are also securing systems on the market, for which a securing slot is available in the vehicle frame. Here a normal claw hook is used with an adapter.

Vehicle superstructures, which do not offer securing points in almost all locations in the outer frame, must be equipped with a rave hook at the loose end of the tension strap. This rave hook is hooked over the rave rail of the outer frame or into the lateral tarpaulin securing edge for the lateral sliding tarpaulin. This method of securing can also be used for a multi-hole outer frame.

## 8. Hooking points for the TruXafe locking beam

The following information relates to articulated lorries with a load length of 13.62 mm and the following pallet types:

- Euro pallet (pool pallet) 800 x 1,200 mm
- Industrial pallet 1,000 x 1,200 mm
- CP3 / CP9 1,140 x 1,140 mm

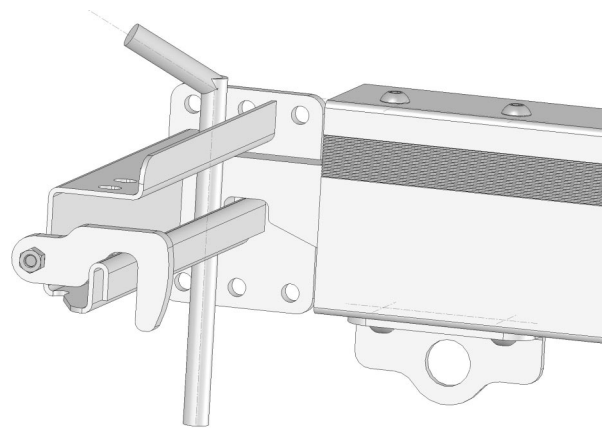
In planning the load it should be taken into account, that the central area of 660 mm between a pair of stanchions has no provision for installing the TruXafe locking beam. The side slats with their square holetrack is interrupted by the end pieces and stanchions.

The hook-in positions for the locking beam when using the above pallet sizes are shown in Appendix (C).

## 9. Storing the TruXafe locking beam

We offer you an additional optional stowage mounting for storing 4 TruXafe locking beams, e.g. during empty trips. This mounting is screwed to the ribbed plate of the articulated lorry **by the customer**. For installing the mounting a free space 2,800 mm long and 400 mm deep is required.

When storing the TruXafe locking beams make sure that the transport safety lock of the beams is in place at both ends. Before commencing a journey the driver must inspect the safety lock. The locking beams can be protected against theft by using a padlock (not included with the mounting).



## 10. Information on the rigidity of the bulkhead

The bulkhead of a 40 t. articulated lorry is constructed and tested according to EN 12642 Code XL for an approx. 13 t. loading capacity, equivalent to  $0.5 \times P$  ( $P$  = payload). However untested superstructures in the 40 t. total weight class, superstructures according to EN 12642 Code L and swap containers according to EN 283 and 284 very often have a bulkhead rigidity of only approx. 5 t. of two dimensional loading. Ask your vehicle manufacturer or an expert (DEKRA, TÜV, etc.), what load your superstructure bulkhead is constructed to carry.

For articulated lorries with a payload of 35 t. to 26 t. of pallets the rigidity of 5 t. is not sufficient. Here the bulkhead for a form fitting cargo securing method would have to withstand at least 12.5 t. to 13 t. of two dimensional load. A factor in the bulkhead loading pressure is the friction coefficient between the cargo and the cargo floor. We recommend the use of anti-slip mats for increasing the friction.

For this 25 t. load example three cargo sections can be formed with the aid of the TruXafe locking beams (see 6 and 7), whereby four locking beams are required. In the 1st cargo section the bulkhead, constructed for a 5 t. load can secure approx. 10 t. of payload via form fitting tolerance-free loading. Two 2.5 t. TruXafe locking beams secure the second cargo section, theoretically 10 t. of cargo. The third cargo section is also secured with two locking beams. Because of the differing pallet sizes available on the market the locking beams must be installed according to the position 8, (see Appendix C).

The TruXafe locking beams are heavily loaded by the forward cargo forces under braking. The locking beams disperse these breaking forces to the lateral TruXafe side slats. Since the load capacity of the bulkhead is limited to 5 t., the locking beam forces must be dispersed directly to the outer vehicle frame via the TruXafe side slats. The dispersal of the forces is accomplished by lateral diagonally attached tension straps. For this diagonal support use tension straps with an LC of 2,500 daN in a straight pull. In this connection please comply with the instructions for use provided with the tension straps.

The lateral diagonal lashing is hooked into the upper locking beam by the relevant upper TruXafe side slat into which the upper locking beam is locked and lashed to the outer frame diagonally downwards to the outer frame at an angle (approx. 30°). The required pretension should be approx. 200 daN. The diagonal lashing relieves the TruXafe side slats and the bulkhead. (see Appendix D).

Superstructures according to EN 12642 Code XL have sufficient bulkhead rigidity for most cargos loaded toward the front. These bulkheads are constructed for a two dimensional load of approx. 13 t. (equivalent to 0.5 x P). Where the cargo is pressure resistant and the friction  $\mu$  0.3 the entire braking force can be absorbed by the bulkhead. If a pressure sensitive cargo is being transported cargo sections must be formed as described above. Here too, at least a lateral lashing strap is recommended because the Code XL bulkhead often cannot absorb the high pressure of the side slats.

Where possible the lateral lashing should be effected according to sketch D1. This lashing arrangement will also secure the lower TruXafe side batten via the secure stanchion.

The free support length of the TruXafe side batten must not exceed 1,400 mm. measured from the middle of the locking beam to the middle of the stanchion. Only in this way is a sufficient bending stability of the TruXafe side batten ensured.

In using lateral lashing according to the sketch (D2-1) the lower edge of the lower TruXafe side slat may not be secured more than 100 mm. above the cargo floor.

For a higher securing the lower TruXafe side batten must also be lashed diagonally (see sketch D-2-2).

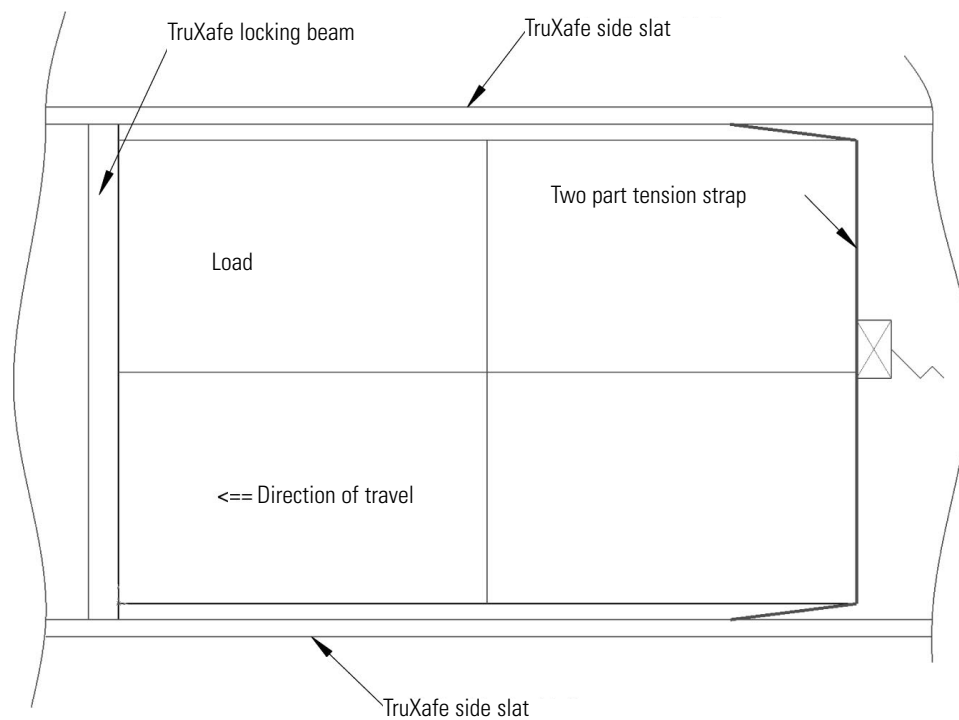


**GB 11. Rear cargo restraint**

Rear cargo restraint can also be effected with TruXafe locking beams. At a friction coefficient of 0.25 (or 0.3 respectively) 10 t. (or 12.5 t. respectively) of cargo can be secured towards the rear using a TruXafe locking beam. The gap between the cargo and the locking beam should not be more than 40 mm. when exploiting the full strength of the TruXafe locking beam.

The corresponding cargo must be suitably rigid for bracing against the locking beam, where necessary empty pallets should be used to spread the load.

Where a TruXafe locking beam cannot be used because of the location of the stanchions, the cargo must be restrained by one or more wrap around lashing straps. These lashing straps are back hooked into the TruXafe side slats according to the sketch.





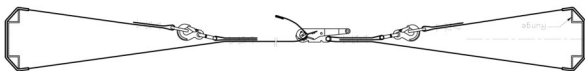
## 12. TruXafe-Pro

Using the TruXafe-Pro stanchion connection the TruXafe system offers an additional opportunity to increase the stability of the centre stanchions. TruXafe-Pro is designed for centre stanchions with a point loading capacity of 400 daN to 750 daN.

The pre-requisite for the use of the TruXafe-Pro is that the cargo height in the relative stanchion area does not exceed 1.6 m and no TruXafe locking beams are used in the stanchion area.

The single part stanchion strap connection consists of a tension strap which is equipped at both ends by delta hooks and to which a snap hook is attached at both ends. The strap between the snap hooks and the delta hook is protected by an additional wear sleeve. The sew back of the free end simplifies handling and a loss of components is avoided.

Successively lay the two ends of the strap around the stanchions to be strengthened and hook the relevant snap hooks into the deltas. Now pull the system tight by hand so that the position of the stanchion strap connection can still be moved by hand. The best effect is achieved by positioning in the centre of the stanchion. After you have positioned the TruXafe-Pro you can now pre-tension the tension strap with approx. 100 daN. Here please follow the instructions for the use of tension straps.



## 13. Mechanical load bearing capacity of TruXafe components

- A strengthened TruXafe side slat with a free bracing length of approx. 3.15 m can absorb a two dimensional force of 810 daN.
- For a cargo width of 2.48 m the TruXafe locking beam can absorb a two dimensional force of 2,500 daN.
- The 2 part tension straps for the diagonal lashing of the TruXafe locking beam have an LC of 1,500 daN over a belt width of 35 mm or an LC of 2,500 daN for a belt width of 50 mm. Normally the tension belt with 2,500 daN is preferred.
- TruXafe-Pro has an LC of 1,500 daN.
- The lateral diagonal straps have an LC of 2,500 daN.

## 14. Special instructions for using TruXafe

**Attention!** If these particularly important instructions are not observed the function of the TruXafe components is no longer assured! Severe accidents with resulting injuries or even death are possible.

- Make sure that the TruXafe system is only used by trained persons. Only in this way can misuse be avoided.
- Inspect the TruXafe components before each use for visible defects. Defective components can fail during use and cause accidents.
- Do not overload the TruXafe component. Always check your load weight which is to be secured. Overloading can lead to breakage or damage.

- Use TruXafe components only according to their purpose. Misuse endangers people and material.
- Defective components must be withdrawn from use immediately.
- Make sure to check your cargo and all TruXafe components after any uncontrolled driving manoeuvre. Slipped cargo can have adverse effects on the handling of the vehicle.
- Only SpanSet or authorised SpanSet specialists may carry out repairs to the TruXafe system. Unqualified repairs endanger people and material.
- Do not exchange any TruXafe components between different types of vehicle. The components are specifically designed for the vehicles, which is why exchanging components causes significant danger of accidents.
- Do not equip any vehicle with TruXafe without reference to SpanSet or an authorised SpanSet specialist dealer. The TruXafe system is individually adapted to each type of vehicle. Only this provides functional security.
- Observe additionally applicable documentation and manufacturer's instructions because the observance of these instructions helps to avoid accidents.

## 15. Area of application and safety information

These instructions for use apply to the entire TruXafe system and its components.

For a large proportion of the goods to be loaded today TruXafe ensures rapid and effective loading and fulfills the demands on cargo securing

- according to § 22 StVO
- according to the VDI guideline 2700ff
- according to VCI, BGF and VDA

The entire TruXafe system has been tested and certified by DEKRA.

You will find the source of the individual standards in Appendix (E) of these instructions for use.

We must point out that the quoted paragraphs, standards and guidelines are examples and may not be complete because these regulations are constantly being amended and/or updated.

Please bear in mind that special safety rules exist for certain sectors and areas of operation. These must be observed and in case of doubt supersede our instructions.

### Safety information

TruXafe is designed for form fitting cargo restraint.

In selection and use of the TruXafe components the type of cargo, the weight, the geometry, the surface characteristics of the cargo and the pressure sensitivity must be taken into account. This and the vehicle itself are the definitive criteria for the selection of the TruXafe components.

**GB** Load your vehicle with foresight. Only in this way can you avoid endangering people and material.

Train yourself and your employees in the use of the entire TruXafe system. SpanSet will be happy to support you in carrying out training. Ask us!

## 16. Storage in the depot

You can maintain the high quality and functionality for a long period by the careful maintenance and correct storage of the TruXafe components. For this reason inspect the system for possible damage after each use. Store the TruXafe components in a clean, dry and well aired area. After a longer period of storage check the product, functionality and completeness of the components.

## 17. Testing and maintenance

The TruXafe components must be checked for visible defects before each use. Should you find defects which negatively affect safety you must withdraw the TruXafe components from further use.

Do not carry out any repairs or maintenance work on the TruXafe components. Use the service provided by the authorised SpanSet specialist dealer or ask for support directly from SpanSet.

## 18. Accessories for load restraint

Please also note the additional SpanSet accessories for load restraint:

- airbags
- SpanSet – Grip
- nets
- tension lashing straps
- corner protection
- etc.

You will find practical tips and useful information in our Homepage at [www.spanset.co.uk](http://www.spanset.co.uk).

## 19. Education and further training

Awareness for good and secure cargo restraint is steadily increasing. At the same time the legal framework conditions are being adapted. Therefore have your employees and yourself educated and trained in cargo restraint technology. SpanSet offers regular training courses in lifting, cargo restraint and height safety technology. Of course we will also train you on site. Ask us!

## 20. Appendices

### Appendix (A1): Various side slat lengths and their permitted loads

Side slat lengths for various superstructure lengths and various stanchion combinations:

<b>Vehicle type</b>	<b>No. of stanchions (approx. loading length)</b>	<b>approx. batten length</b>
Articulated lorry	3 Pairs – stanchions ( i. L. 13,620 mm )	3,200 mm
Articulated lorry	4 Pairs – stanchions ( i. L. 13,620 mm )	2,500 mm
Articulated lorry	5 Pairs – stanchions ( i. L. 13,620 mm )	2,200 mm
Superstructure – road train e.g. swap containers C 745	1 Pair – stanchions ( i. L. 7,310 mm )	3,490 mm
Superstructure – road train e.g. swap containers C 745	2 Pairs – stanchions ( i. L. 7,310 mm )	2,260 mm
Superstructure – road train e.g. swap containers C 782	1 Pair – stanchions ( i. L. 7,680 mm )	3,680 mm
Superstructure – road train e.g. swap containers C 782	2 Pairs – stanchions ( i. L. 7,680 mm )	2,390 mm
Superstructure – road train e.g. lorry – fixed superstructure, exterior approx. 8,170 mm long	1 Pair – stanchions ( i. L. 8,075 mm )	3,850 mm
Superstructure – road train e.g. lorry – fixed superstructure, exterior approx. 8,170 mm long	2 Pairs – stanchions ( i. L. 8,075 mm )	2,510 mm

the side slats were added. The additional was not taken into consideration. (ble BigBags) and the friction value, three (ient rigidity of the TruXafe side slats. The manufacturer's information: High payloads r three rows of slats.

### TruXafe – Lateral slat lengths and their permitted loads (1)

Length (m)	No. of rung pairs	Slat length in metres (approx.)	Calculated free bracing length in metres	Max. permitted load on a slat in total or per 1 metre respectively (2)	Load to be braced by two rows of slats; 0.5 g transverse acceleration and 0.25 friction value (3)	Required min. bracing strength for transverse acceleration and 0.25 friction value, per metre with two rows of slats
3.15	3	3.15 – 3.30	3.15	810 daN / slat 253 daN / 1 m	8 slats times 810 daN = : 6,480 daN in total 506 daN / 1 m in total	Articulated lorry – 26 t payload, min. bracing strength for 34 pallets = : (26 / 13.62) * 0.25 = 477 daN / 1 m
2.45	4	2.45 – 2.60	2.5	1,000 daN / slat 400 daN / 1 m 209 daN / 1 m	10 slats times 1,000 daN = : 10,000 daN in total 800 daN / 1 m in total	Articulated lorry – 26 t payload, min. bracing strength for 34 pallets = : (26 / 13.62) * 0.25 = 477 daN / 1 m
3.49	1	approx. 3.49	3.44	720 daN / slat 209 daN / 1 m	4 slats times 720 daN = : 2,880 daN in total 418 daN / 1 m in total	Road train – superstructure – 12 t payload, min. bracing strength for 18 pallets = : (12 / 7.3) * 0.25 = 411 daN / 1 m
2.26	2	approx. 2.26	2.21	1,100 daN / slat 498 daN / 1 m	6 slats times 1,100 daN = : 6,600 daN in total 996 daN / 1 m in total	Road train – superstructure – 15 t payload, min. bracing strength for 18 pallets = : (15 / 7.3) * 0.25 = 514 daN / 1 m
3.68	1	approx. 3.68	3.63	680 daN / slat 187 daN / 1 m	4 slats times 680 daN = : 2,720 daN in total 377 daN / 1 m	Road train – superstructure – 11 t payload, min. bracing strength for 19 pallets = : (11 / 7.68) * 0.25 = 358 daN / 1 m
2.39	2	approx. 2.39	2.34	1,040 daN / slat 444 daN / 1 m	6 slats times 1,040 daN = : 6,240 daN in total 888 daN / 1 m in total	Road train – superstructure – 15 t payload, min. bracing strength for 19 pallets = : (15 / 7.68) * 0.25 = 488 daN / 1 m
3.85	1	approx. 3.85	3.8	650 daN / slat 171 daN / 1 m 342 daN / 1 m	4 slats times 650 daN = : 2,600 daN in total 342 daN / 1 m in total	Road train – superstructure – 11 t payload, min. bracing strength for 20 pallets = : (11 / 8.075) * 0.25 = 340 daN / 1 m
2.51	2	approx. 2.51	2.46	1,000 daN / slat 406 daN / 1 m	6 slats times 1,000 daN = : 6,000 daN in total 812 daN / 1 m in total	Road train – superstructure – 20 t payload, min. bracing strength for 20 pallets = : (20 / 8.075) * 0.25 = 619 daN / 1 m

#### Text of Appendix

- (1) The permitted loadings of the TruXafe
- (2) The forces operating on the side slat Without the two diagonal lashings the st superstructures of type classes (B) and (C) the stanchions must be able to bear in re installed near stanchions or TruXafe-Pro r chions.

**Appendix (B): Comparison of the rigidities of various side slats**

A comparison of some side slats:

<b>Model</b>	<b>Dimension (cross section)</b>	<b>Max. length load ( 1 )</b>	<b>Deflection at max. length load ( 1 )</b>	<b>Weight ( 4 )</b>	<b>Comparison of the load to TruXafe</b>
Wooden batten	130 x 25 mm	70 daN	321 mm	6.80 kg	8.7 %
Aluminium batten	100 x 25 mm	172 daN	182 mm	3,74 kg	21,2 %
Aluminium batten	150 x 25 mm	215 daN	183 mm	5,34 kg	26,5 %
Steel C - profile	25 x 120 x 25 x 2 mm	235 daN ( 2 )	109 mm	11.33 kg	29.1 %
Steel C - profile	25 x 120 x 25 x 2.5 mm	302 daN ( 2 )	120 mm	13.65 kg	37.4 %
TruXafe - Aluminium	175 x 36 mm	810 daN ( 3 )	184 mm	11.40 kg	100.0 %

( 1 ) at 3,100 mm bracing length

( 2 ) at QSTE 380

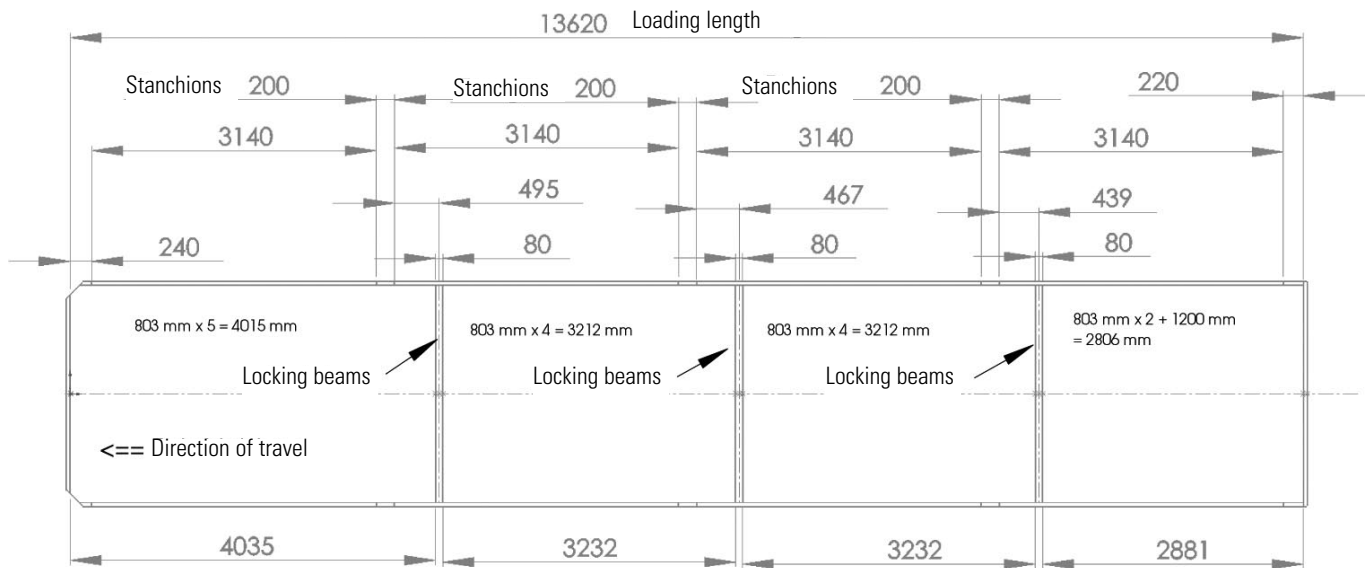
( 3 ) in test at 10mm retained deformation = 1000 daN

( 4 ) Own weight at 3,200 mm length

**GB Appendix (C) Locking beam positions for a 13.62 m long loading length**

**Appendix C1**

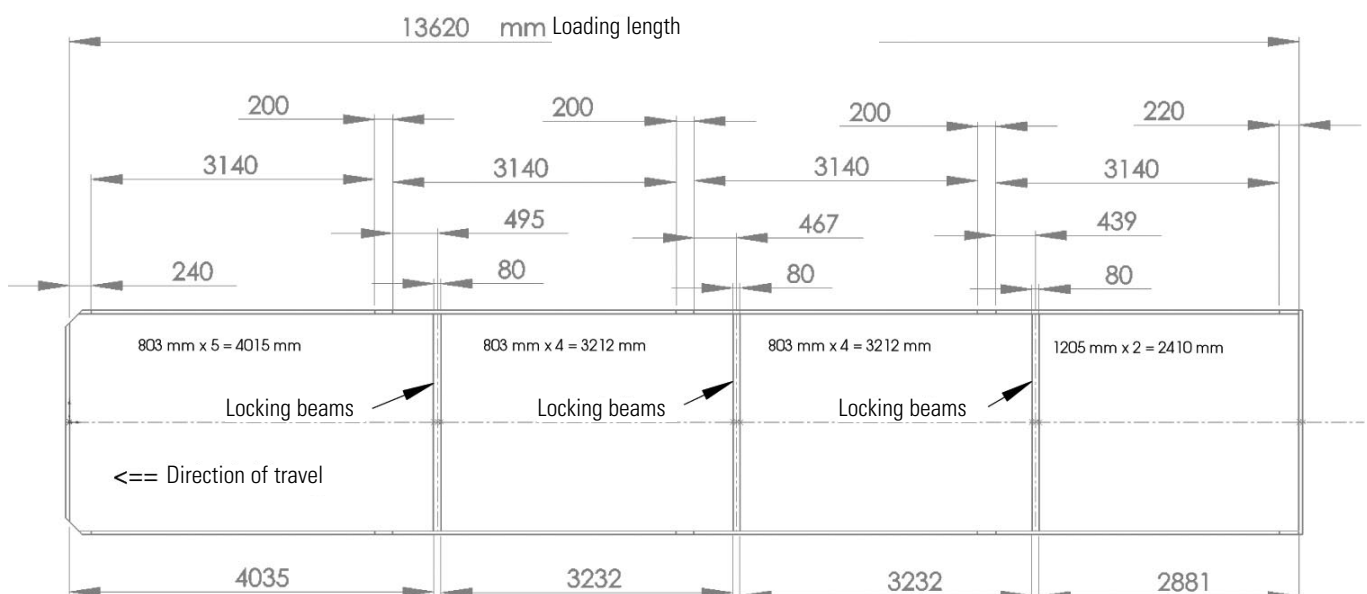
Loading plan for 33 EWO pallets  
( 1200 x 800 ) mm



All quoted dimensions are approximate! They can vary slightly according to the vehicle manufacturer.

**Appendix C2**

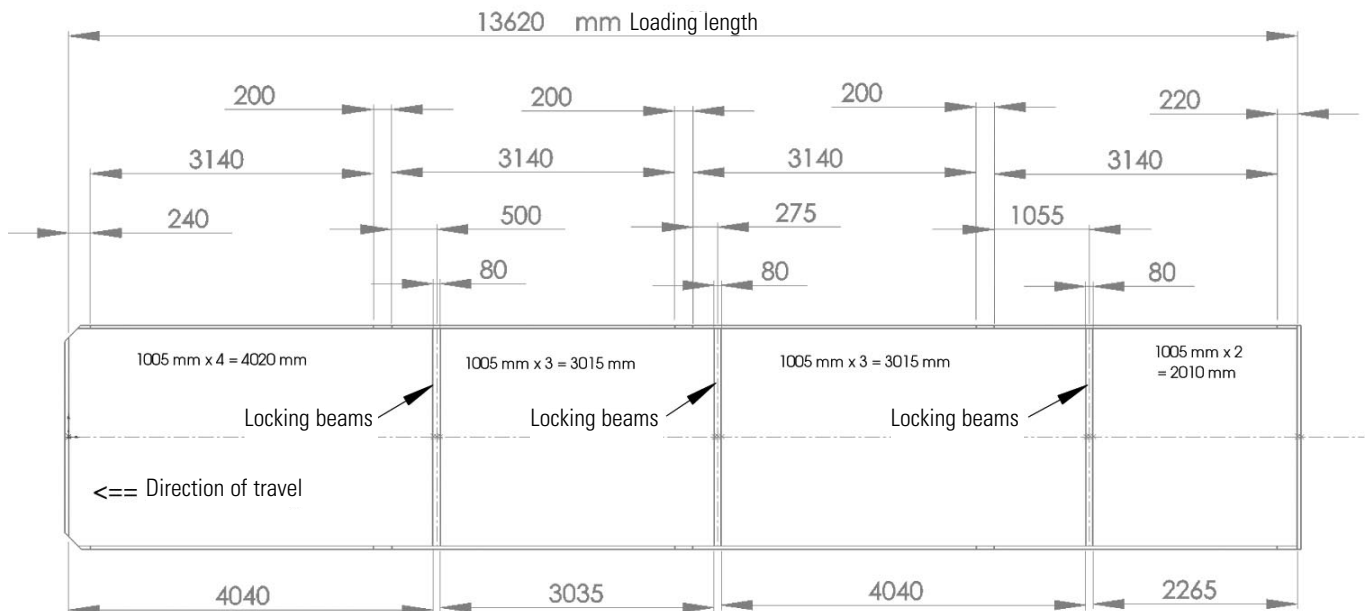
Loading plan for 32 EWO pallets  
( 1200 x 800 ) mm



All quoted dimensions are approximate! They can vary slightly according to the vehicle manufacturer.

**Appendix C3**

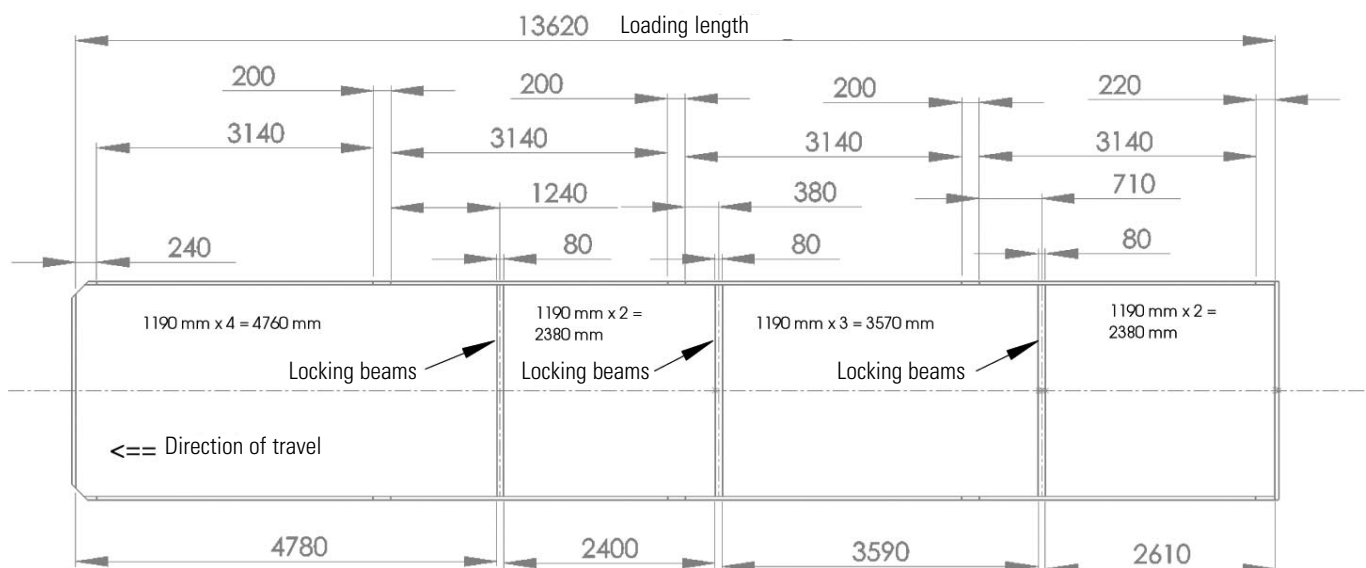
Loading plan for 26 industrial pallets  
( 1000 x 1200 ) mm



All quoted dimensions are approximate! They can vary slightly according to the vehicle manufacturer.

**Appendix C4**

Loading plan for 22 CP3 / CP9 pallets (1,140 x 1,140) mm with four drums of 216.5 litre capacity each with a diameter of 590 mm, i.e. each pallet requires an area of (1,190 x 1,190) mm.



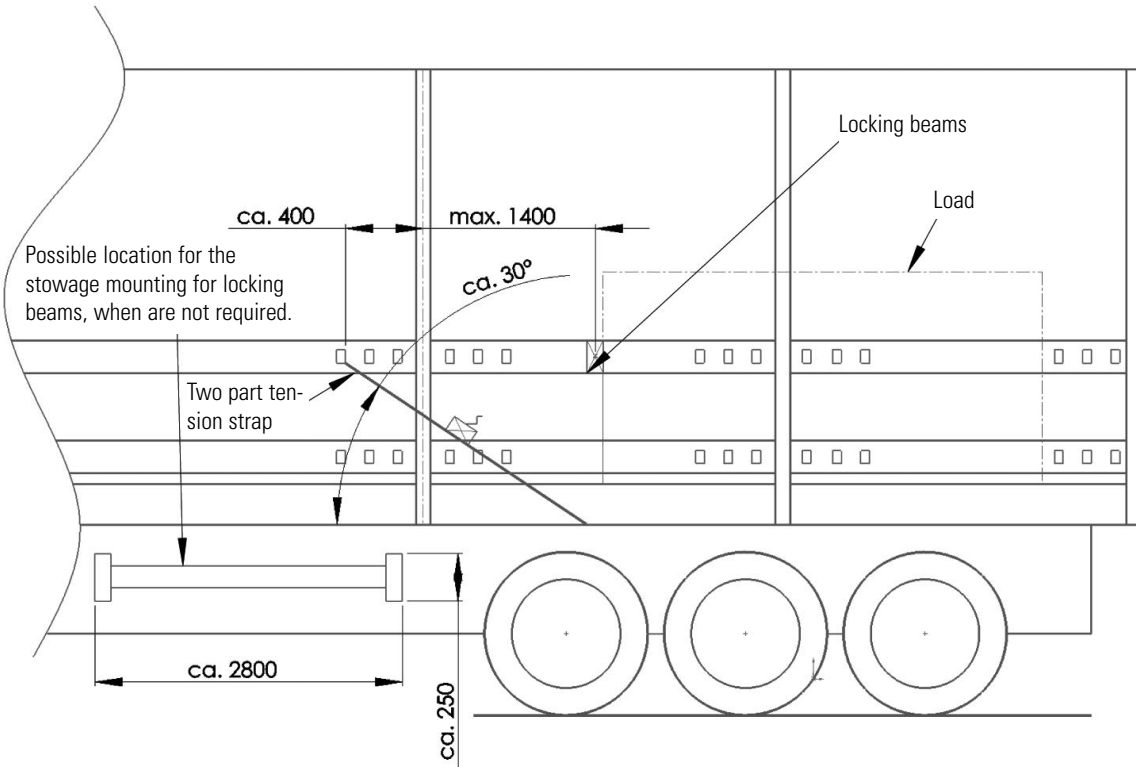
All quoted dimensions are approximate! They can vary slightly according to the vehicle manufacturer.



**GB** Appendix (D): Lateral lashing of the TruXafe side slats

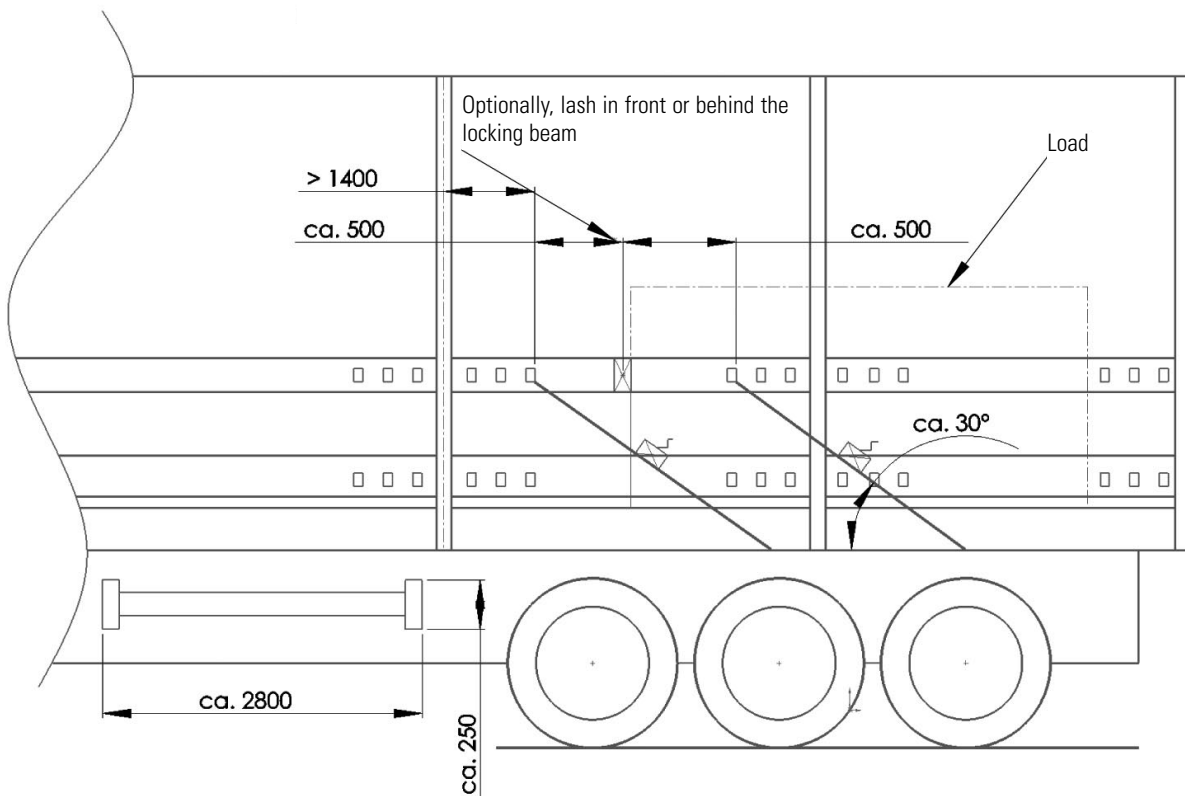
**D1**

Diagram of the lateral diagonal lashing and the possible location for the stowage mounting for locking beams, when are not required.



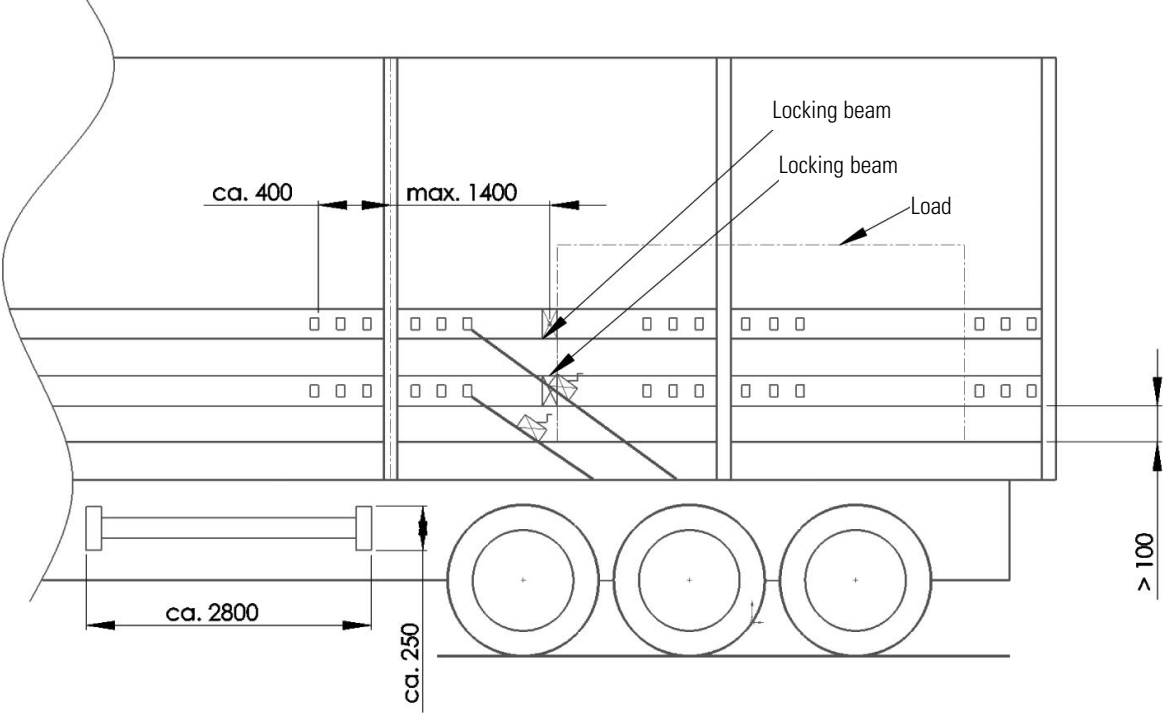
**D2 - 1**

Diagram of the lateral diagonal lashing and the possible location for the stowage mounting for locking beams, when are not required.



**D2 - 2**

Diagram of the lateral diagonal lashing and the possible location for the stowage mounting for locking beams, when are not required.



**GB Appendix (E): Laws, standards and guidelines (applicable in Germany)****Laws:**

§ 22	Para. 1	StVO	Loading – traffic safety
§ 23		StVO	Other obligations of the vehicle owner
§ 30	Para. 1	StVZO	Characteristics of the vehicles
§ 31	Para. 2	StVZO	Responsibility for the operation of the vehicle
§ 412	Para. 1	HGB	.... to load the goods safely for transport; attaché....

**Accident prevention regulations vehicles: (applicable in Germany)**

§ 22	Para. 1	UVV BGV D29 ( old VGB 12 )	Vehicle superstructures must be of such a kind....
§ 37	Para. 4	UVV	... the cargo must be loaded in such a way....

**VDI Guidelines 2700 ff (national guidelines in Germany)**

VDI	2700		Securing of cargo on road vehicles	2004 - 11
VDI	2700		(a) Evidence of training in the securing of cargo	2002 – 01
VDI	2700	Sheet 1	Training and training content	2005 – 03
VDI	2700	Sheet 2	Lashing powers	2002 – 11
VDI	2700	Sheet 3.1	Instructions for the use of lashing material	2006 – 10
VDI	2700	Sheet 3.2	Installations and aids for securing loads	2006 – 01
VDI	2700	Sheet 4	Load distribution plan	2000 – 05
VDI	2700	Sheet 5	Securing of loads in the QM system	2001 – 04
VDI	2700	Sheet 6	Combining loads with piece goods	2006 – 10
VDI	2700	Sheet 7	Securing of loads in combined loading traffic	2000 – 07
VDI	2700	Sheet 8	Securing of private vehicles and light commercial vehicles on vehicle transporters	2000-03
VDI	2700	Sheet 9	Securing of paper rolls	2006 – 04
VDI	2700	Sheet 10	Securing of prefabricated concrete elements	in preparation.
VDI	2700	Sheet 11	Securing of reinforcing steel	2006 – 10
VDI	2700	Sheet 12	Securing of loads in drinks transport	Draft
VDI	2700	Sheet 13	Securing of heavy transport	2006 – 05
VDI	2700	Sheet 14	Friction values and their calculations	in preparation.
VDI	2700	Sheet 15	Anti-slip materials	in preparation.
VDI	2700	Sheet 16	Securing of loads in transporters of up to 5.5 t zGM	Draft
VDI	2700	Sheet 17	Securing of loads in tip and drop containers	2006 – 10
VDI	2700	Sheet 18	Packaging typical of the chemical industry	in preparation.
				from 2007 - 10

**National guidelines: (in Germany)**

VDI 3968 Sheet 1	Securing of cargo loads – requirement profile	( Status: Jan. 1994 )
VDI 3968 Sheet 2	Securing of cargo loads – organisational and technical procedures	( Status: Jan. 1994 )
VDI 3968 Sheet 3	Securing of cargo loads – hoop casing	( Status: Jan. 1994 )
VDI 3968 Sheet 4	Securing of cargo loads – shrinking	( Status: Jan. 1994 )
VDI 3968 Sheet 5	Securing of cargo loads – stretching	( Status: Dec. 1994 )
VDI 3968 Sheet 6	Securing of cargo loads – other procedures	( Status: Jan. 1994 )

**Standards:**

DIN 75410 – 1	Lashing points on commercial vehicles for goods transport with a permitted total weight of up to 3.5 t	2003 – 07
DIN 75410 – 2	Securing of loads in private car, private estate cars and multi-purpose private cars	2005 – 11
DIN 75410 – 3	Securing of loads in vans	2004 – 10
EN 12195 – 1	Calculation of lashing powers	2004 – 04
EN 12195 – 2	Lashing belts made of chemical fibre	2001 – 02
EN 12195 – 3	Lashing chains	2001 – 07
EN 12195 – 4	Lashing wire cables	2004 – 04
EN 12640	Lashing points on commercial vehicles for the transportation of goods	2001 – 01
EN 12641 – 1	Swap containers and commercial vehicles tarpaulins	2005 – 10
EN 12641 – 2	Swap containers and commercial vehicles sliding tarpaulins	2007 – 01
EN 12642	Superstructures on commercial vehicles	2007 – 01
EN 283	Test requirements on swap containers	1991 – 08

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# ZERTIFIKAT

313/1410/702073/1804700809

Hiermit bestätigt die DEKRA Automobil GmbH der

**SpanSet GmbH & Co. KG**  
in 52531 Übach-Palenberg

die Wirksamkeit des

**SpanSet TruXafe**

**Ladungssicherungssystem**

als Zusatzausstattung für Fahrzeugaufbauten gemäss  
DIN EN 12642 zur Erfüllung der derzeit geltenden  
Anforderungen und Regeln der Technik zur  
Ladegutsicherung wie der DIN EN 12195-1 und den  
Richtlinien der VDI 2700 ff.

33604 Bielefeld, 19. März 2007

  
Der DEKRA Sachverständige  
Dipl.-Ing. Wolfgang Bühren

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