SpanSet®

03

Height Safety
Lifting
Load Control
Safety Management

SpanSet
Certified
Safety

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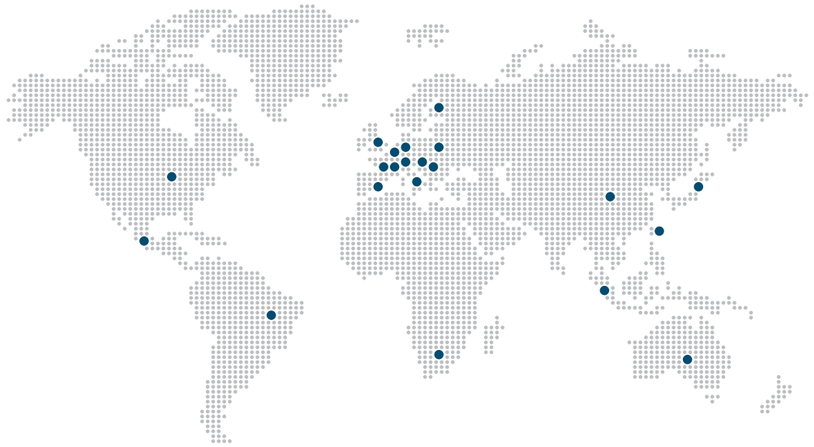
Legend
Please unfold! Here you will get an overview of the product advantages.

SpanSet Group world wide



Internationality and worldwide presence
Characterised by continuous growth, the SpanSet Group has developed into a company operating in the global market in the sectors of load securing and lifting technology, fall protection and safety management. Today, 22 production and sales companies spread across 21 countries belong to the SpanSet Group, so that users on every continent can benefit from the comprehensive know-how and the innovative product developments. The holding company - SpanSet Inter AG - has been based in Switzerland since 1967. Today, the owner-managed company is based in Wollerau near Zurich in the canton of Schwyz.

Competence Centre

Switzerland, Lifting technology
Germany, Lifting technology and Load control
Great Britain, Height safety

Branches

Europe
Spain, France, Italy, Netherlands
Hungary, Poland, Finland, Czech Republic, Austria

Australia, North and South America
Australia, USA, Mexico, Brazil

Asia and Africa
Indonesia, Japan, China, Taiwan, South Africa

Avoid damage, prevent accidents

Load control is more than just protecting pallets, boxes and other items of goods. It is also always directly about the safety of people. People are involved in every transport - actively at the wheel, passively as road users and passengers. With SpanSet products, drivers as well as forwarders and shippers rely on the most modern and safety-tested equipment.

Ratchets, lashing straps, anti-slip mats and accessories: Please take it for granted that everything in this catalogue fulfils the legal requirements and the specifications of the standardising bodies. Our company standard goes far beyond the standard. It often anticipates regulations that will only be valid years later. SpanSet customers benefit from the fact that we have been involved in the standards and guidelines work of various committees for decades.

We develop innovations on our own. We always keep in mind what our customers report from practice and what wishes they have for us. Users learn how to use our products perfectly in face-to-face training courses and via e-learning.

We produce at our own locations. That's why we have it in our own hands to meet our - and certainly your! - quality requirements and to implement our environmental management system. The testing and repair service is also about sustainability and economy. What can be fixed should not be carelessly thrown away! Our considerable investments in photovoltaics and resource-saving production technology at the Übach-Palenberg site should be seen in the same context.

With our catalogue, we present a high-quality range of load securing technology that makes your work safer, avoids transport damage and prevents accidents.

SpanSet - Certified Safety

Andreas Höltkemeier Patrick Schulte

© Foto: Volvo Cars

How the car safety belt became the standard for safety. The history of SpanSet.

The foundation: the development of the vehicle safety belt.
Sixty years ago, cars had no safety belts and accidents, that today leave you unharmed had fatal consequences. For more passenger safety, the car manufacturer Volvo turned to the small Swedish ribbon weaving company AB Textilkonst & Klippan in the late 1950s to jointly develop the world's first car safety belt made of high-strength textile ribbon. This was fitted to the Amazon and 544 models in 1959 and caused great astonishment among the public - but, as we know, soon became a great success.

1966 – SpanSet Germany is founded.
Due to the high level of demand, Erik Ehnimb, the co-owner of Klippan, founded the SpanSet company in Malmö in 1966. The extremely high loading capacity of the straps produced quickly made them quickly ensured their use in areas where chains and wire ropes had previously been used. In the same year, SpanSet GmbH & Co. KG in Germany followed shortly afterwards by SpanSet AG in Hombrechtikon in the Zurich highlands. Subsidiaries in Europe, Asia, America and Australia followed and are still part of the worldwide production and distribution network today.

The 70s and 80s - decades of innovations
The safety belt was the beginning of a multitude of innovative products that SpanSet brought to the market over the decades. In the 70s, a lashing strap system for securing cars on car transporters was developed with Ford plants. In addition, the secutex coating for lifting straps and protective sleeves was an important step in lifting technology. Lifting straps and round slings could now be used for the first time for lifting and turning sharp-edged loads. This was followed in the 1980s by the Ergo ratchet, the world's first tension ratchet with a pre-tensioning measuring display. A new generation of round slings with textile fibre reinforcement in the protective casing significantly increased the tear resistance and for the first time the know-how in load control and lifting technology was used in training courses.

ABS ratchets conquer the market.
The 1990s marked the appearance of another innovation: the ABS ratchet. This product enabled gradual release of the tensioned ratchet for the first time, for example in order to catch goods at risk of tipping over in good time. Due to a great reception from users, the Ergo tensioning ratchet was later also equipped with the ABS system. In 1994, TÜV Rheinland certified that SpanSet had a quality management system managed in accordance with DIN ISO 9002/EN 29002. What is more, the SpanSet quality management system is now certified in accordance with DIN EN ISO 9001:2000. In addition, the late 1990s saw SpanSet begin manufacturing and selling personal protective equipment to protect against falls.

Continuous development in the new millennium.
At the beginning of the 2000s, the first tension ratchet with integrated pretensioning indicator appeared on the market. For the first time, the unique TFI (Tension Force Indicator) showed the actual pretensioning force achieved directly on the ratchet and ensured greater safety and economy when using the lashing systems. With SpanSet MaXafe, a heavy-duty ratchet has been available since 2020 for the first time that has a strap elongation of a maximum of 2% - and that with a strap width of only 55 mm. Through the integration of the current SpanSet Axzion GmbH, the spectrum has also been expanded through the development of innovative lifting devices. Not only because of the Upending Tool, the largest gripper in the world, Axzion is one of the market leaders in its sector.

Looking back, SpanSet is proud of its history. Decades of research and development have contributed to greater safety, easier work, less accidents and lower operating costs around the world. On this foundation, SpanSet is facing the challenges of the future with more than 20 production and sales companies and around 1,000 employees.

SpanSet – Certified Safety

How SpanSet ensures the highest levels of safety in areas other than load control.

01 Height Safety

SpanSet offers a large range of products for height safety, which is always developed in close cooperation with the customers. The best example of this is the permanent stainless steel „Safeline“ lifeline system, which is used as horizontal and vertical fall protection and is manufactured for use according to customer requirements. Even for very complex applications we find highly specialised solutions. The international orientation is of great benefit to SpanSet. All over the world, customers benefit from the close cooperation of the SpanSet Group. With the EN standards firmly in mind, we know what the users need and what the legislators demand from users of personal protective equipment against falls from a height (PPE). Our extensive range for height safety technology includes:

- Full body harnesses
- Safety vests
- Lanyards
- Carabiners
- Safety ropes
- Anchor devices, anchor points
- Horizontal securing systems
- Rescue systems

02 Lifting

In the late 1960s, chains or hemp ropes were used to lift heavy loads. During this time SpanSet developed new solutions from high-strength plastic fibres. Today, textile lifting straps and round slings from SpanSet are used worldwide when challenges need to be overcome. Ancient works of art, entire grandstand roofs and ships have been lifted because you can rely on the high-tech lifting gear „Made in Germany“. Through constant innovations and a certified quality assurance standard, SpanSet has developed into the market leader. With SpanSet Axzion, a specialist for the on- and offshore industry also belongs to the group of companies. secutex coatings and protective sleeves complete the unique product range in lifting technology consisting of:

- Round slings up to 450 t load capacity
- Lifting straps
- Round sling and belt hangers
- Protective sleeves, protective plates and clips
- Extensive accessories
- Coil hooks and loading forks
- Pliers and grabs
- Special solutions for the offshore industry

03 Load Control

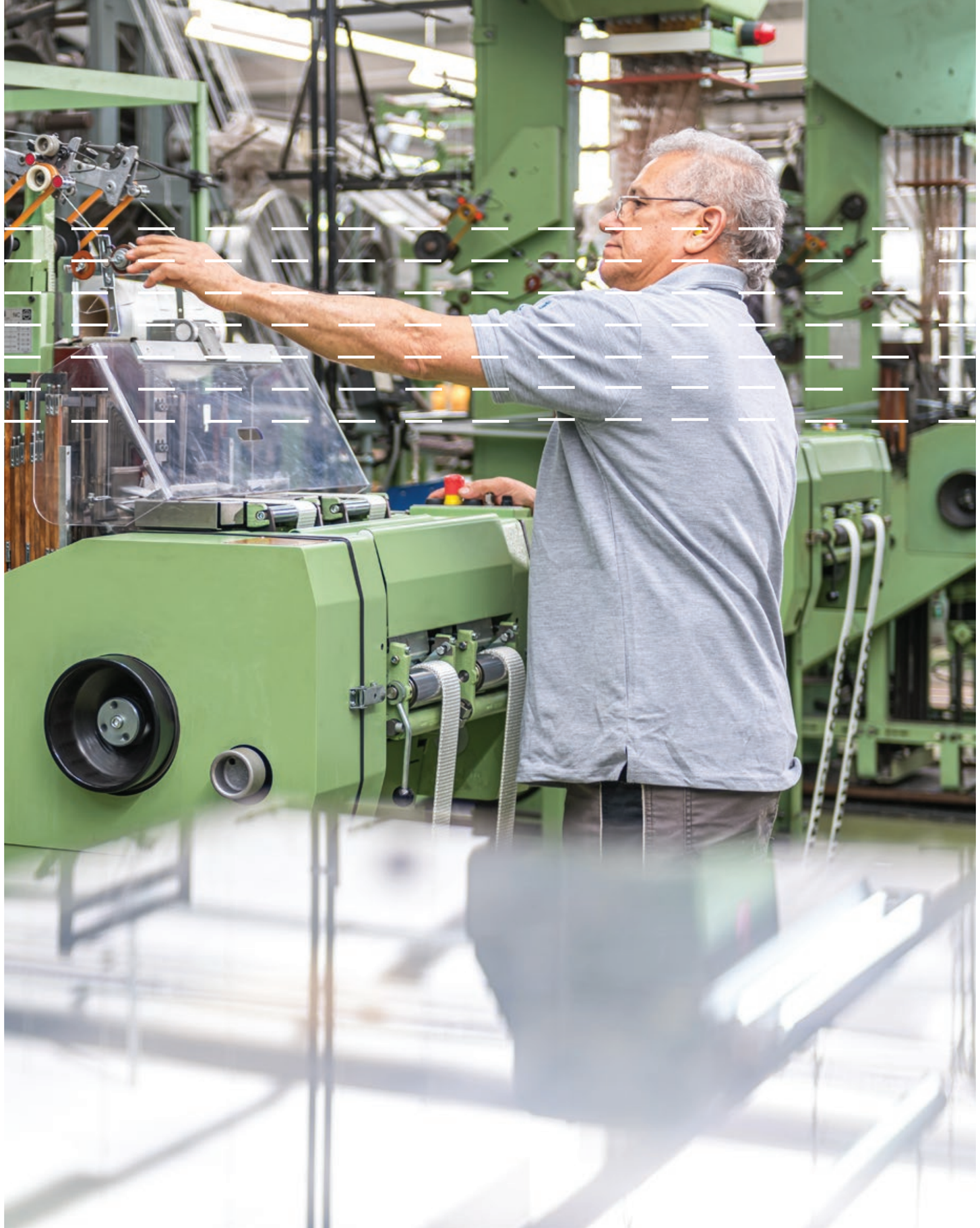
Safety comes first when it comes to the transportation of goods and the protection of everyone involved. Not only does it ensure a relaxed working environment, it is also required by law. With SpanSet load securing equipment, you effectively avert dangers and accidents and comprehensively comply with legal requirements. Customers include companies with the highest safety demands, such as car manufacturers, the chemical, steel and paper industries, freight forwarders or fire departments. Pressure and tension ratchets for the heaviest loads up to 12,500/25,000 daN permissible tractive force, load securing nets, lashing systems for vehicle transport, edge protectors and much more have been increasing safety in the load securing industry for decades. Our extensive range for load control includes:

- Heavy duty, tension and pressure ratchets
- Clamp lock lashing straps
- Load securing for curtainsiders
- Anti-slip mats
- Load securing nets
- dunnage bags
- Edge protectors and protective sleeves
- Lashing systems for securing vehicles

04 Safety Management

As a partner to our customers, we want to be more than just a supplier of high-quality products - we want to support you in effectively avoiding risks. This naturally includes competent advice, a testing and repair service and other services that sustainably improve and simplify working at height, lifting loads or securing loads. SpanSet therefore offers a wide range of further training opportunities in our safety training centre „STZ“ in Übach-Palenberg and other locations in Germany, where you can deepen specialist knowledge and gain new knowledge from our certified and trained instructors. With know-how and many years of experience, we offer our customers full service safety management consisting of:

- Customer service and project management
- Trainings & workshops
- Inspection service
- Installation & repair
- Useful tools
- Individual solutions



Production site Germany: Lashing straps, round slings and more.

From thread to lifting strap, from steel to load handler, from ratchet to lashing strap: SpanSet develops, manufactures and tests its products at four sites in Germany. Production in Germany contributes to high quality standards and enables custommade products, special solutions and comprehensive customer service.

Übach-Palenberg
Lashing straps, round slings and more.
52 weaving machines produce approx. 750,000 m of straps and tub strap in Übach-Palenberg every month. Broadband loom systems allow SpanSet to manufacture polyester fabrics up to 600 mm wide entirely in-house. Automation technology has become an increasingly important component of production in Germany today. For example, Europe's largest sewing machine enables CNC-controlled production of load securing nets with a seam field size of 7 x 3.5 m, and a fully automated lashing strap machine produces small series of lashing straps fully automatically. In addition, our own test laboratory situated on company premises ensures quality assurance during the development phase.

Geilenkirchen
Unique coatings.
SpanSet secutex is the coatings specialist within the SpanSet Group. The development and manufacture of impact, sound and surface protection, e.g. roll coating, protective tubes, hard coatings, edge protectors, but also individual solutions are part of the daily business in Geilenkirchen. From their own premises - just a few kilometres from SpanSet - around 70 employees ensure that secutex remains a popular choice around the world.

Neustrelitz
Specialists for the On- and Offshore Industry.
SpanSet Axzion stands for „German Engineering" and offers the customer development, production and service from a single source. In Neustrelitz near Berlin, SpanSet Axzion manufactures around 1,200 hoists a year for customers throughout Europe. Special solutions for the onshore and offshore industry in particular are part of the daily business here. The company also has a test tower on its premises that is unique in the world and enables tests to be carried out on load-bearing and lifting equipment weighing up to 1,800 tonnes.

Load Control „Made by SpanSet“

How we protect people and loads against the dangers of accidents and ensure optimal protection for the equipment.

When it comes to the transport of goods and the protection of all those involved in this work, safety is of utmost important for you and for us. Not only does this provide a feeling of reassurance, it is also prescribed by law. With our load control equipment, you can effectively guard against dangers and accidents while complying fully with the statutory requirements.

Our customers include companies and organisations with the most stringent safety requirements. For example, automotive and aerospace manufacturers, the chemical, steel and paper industries, energy suppliers, haulage companies, fire brigades and aid organisations all rely on our quality products. Pressure and tensioning ratchets for the very heaviest loads, from 125/250 daN to 12,500/25,000 daN LC, load control nets for quick use with constantly changing freight and an extensive range of accessories, such as our edge protectors for delicate goods, have been raising safety standards in the load control sector for decades now.

100 % quality - 100 % safety
From the material selection to the quality test, from exact calculations to intelligent application – we give 100% at every stage. We weave the majority of our straps ourselves – in Germany. In order to ensure that you receive only completely reliable and practical load control equipment, we employ experts from the various sectors and develop new products in collaboration with universities of applied science and other institutions.

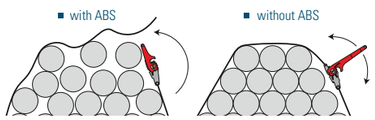
Tested and certified
Our quality management system involves ongoing tests of materials and end products. These materials and end products are subject to continuous checks in our in-house laboratory and in external test series. We test the maximum load, strength and durability. For many years, well-known institutions such as the employers‘ liability insurance association, DEKRA, TÜV and DNV GL have been carrying out regular testing and certification of our products and the manner in which our quality management system is organised.

By using SpanSet quality products, you are doing everything possible to guarantee the safety of people and of the goods being transported in terms of load control.

SpanSet – Certified Safety

ABS „Anti-Belt-Slip“ procedure

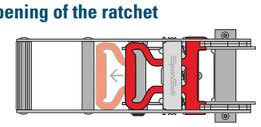
allows pre-tension to be released in small stages



The ABS system was developed for loads at risk of tipping over and allows the user to release the pre-tension in small stages. This allows you to position loads that are at risk of tipping over and lean against the strap in an upright position. This helps to prevent damage and accidents. The lashing system can also be opened fully straight away, so that no time is lost when transporting steady loads.

Self-locking ratchet lever

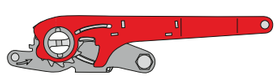
Prevents unintentional opening of the ratchet



For maximum security during lashing operations we developed the self-locking ratchet lever. When lashing, the integrated functional slider is pulled down. When the ratchet is closed, it automatically locks into place in the lock position. Unintentional opening of the ratchet during transportation is thus effectively ruled out – even when the load is exposed to strong vibrations and shaking.

Extended ratchet lever

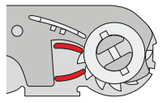
for improved force transmission and better ergonomics; protects backs



The extended lever not only allows the user to achieve increased pre-tensioning forces, but it also makes lashing considerably easier. High pre-tensioning forces can be achieved with markedly less muscle power. In particular the pull ratchets with the long lever are gentler on the back and are more adapted to ergonomic requirements.

Double slider

more tension force, less muscle strength



The double slider even secures in the intermediate stage when tensioning the webbing. Two sliders engage in an existing sprocket in „smaller steps“. This helps you to achieve greater tension while preserving your physical strength.

EPX Epoxy resin coating

Coating of chrome- and zincplated sheet steel ratchet

We place maximum value on quality in each individual element. The ratchets are first zinc-plated, then chrome-plated and coated with a shock-resistant epoxy resin coat which additionally protects the ratchets from e.g. rust.

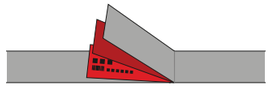
Folded label

to protect against damage with information sewn inside

SpanSet cam buckle straps are fitted with a folded label which is sewn on in two layers and is thus tear-resistant. The writing on the inside is protected against abrasion. The label is made shorter by the fold in the middle and is thus exposed less to wind and shearing forces.

Webbing insert

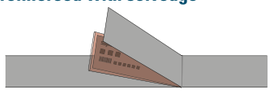
protected label thanks to a „fabric shield“



The labels on all SpanSet ratchet lashing straps are additionally protected by a webbing insert. The „fabric shield“, combined with the advantages of the folded label, prolongs the service life of your lashing straps.

Protective sleeve label

optimally protected, reinforced with selvedge



In addition to the tear-resistant design with a fabric lining, a robust plastic sleeve perfectly protects the writing from abrasion and dirt. The webbing insert, equipped as standard, also prolongs the service life.

SPANSET PRODUCT ADVANTAGES

Overview

Tension Force Indicator 750daN TFI

with an indicator to show the actual pre-tensioning force achieved

■ TFI 500 daN ■ TFI 750 daN ■ TFI 1.000 daN

With the TFI you can read off the pre-tensioning forces achieved in the lashing system when tying down loads and use this information in load control calculations. There are three variants available, with 500 (green), 750 (red) and 1,000 daN (yellow). The use of a TFI at the adjustable and fixed end is particularly effective, as it can display a pre-tensioning force of 1,000, 1,500 and 2,000 daN. Consequently, less lashing equipment is required for load control, which accelerates loading and unloading and offers major economic advantages.

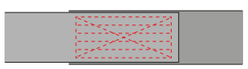
Reinforced edges

makes straps more resistant to wear and abrasion

Webbing with the reinforced edge is more resistant to wear and abrasion. Your advantage: longer service life and lower costs!

Automatic seam

precise and of consistent quality



The automatic seam is very precise and of consistently high quality. The black sewing thread (shown here in red) provides a very good contrast on the webbing, which makes visual inspection much easier and faster. This reduces costs and effort.

Optimal alignment

of the strap to the cam buckle

The SpanSet cam buckle straps are optimally designed to the width and thickness of the compatible webbings. This prevents premature wear and ensures a secure hold of the strap inside the cam buckle.

Precision strap 4%

Low elasticity of the strap

With a webbing stretch of less than 7%, Spannfix ratchets meet the requirements of the standard. Our quality systems even have as little as 5% webbing stretch. Less stretch is more rational, as this decreases the need for readjusting the tension.

Extreme low elongation <2%

exceptionally low Elongation of the webbing

The high-performance fibres in the webbing ensure an exceptionally low elongation of less than 2 % - comparable to wire ropes or chains. The forces are transferred directly into the lashing system during full braking or evasive movements and slippage of heavy goods is reduced to a minimum.

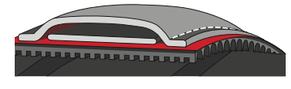
Special custom-made products

Special lengths, desired colour, printing and much more

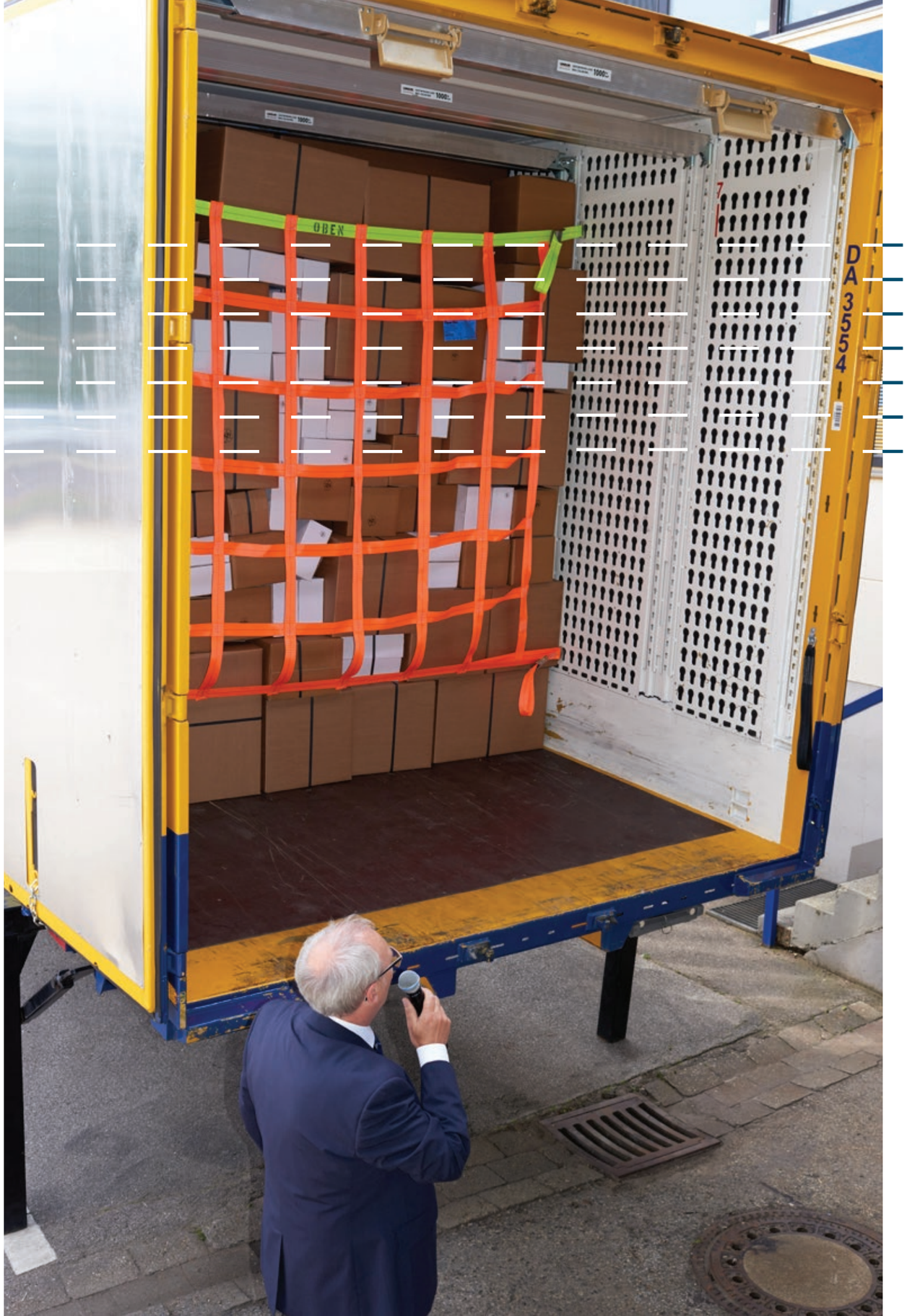
Special designs can be produced specifically to customer requirements. Ratchets and clamp locks, hooks and eyes, straps, strap colours, individual printing can be combined to match each other. Please contact us.

Internal sliding surface ETA

reduced friction, higher preload forces



As a support for the webbing, an internal sliding surface ensures an even better ETA value. This tells how much of the force generated with the tensioning element arrives on the opposite side. The tunnel design reduces friction and enables a higher pre-tensioning force.



Practical Guidlines – The path to optimal load control

Structure of textile lashing straps
The **one-piece lashing strap** consisting of tensioning device 1 and webbing 2 is used for strapping around the load and therefore does not need any end fittings such as eyes or hooks.

The **two-piece lashing strap** consists of a fixed end (FE) 4 an end fitting (EF) 5, a tensioning device (TD) 1 and an adjustable end (AE) 3 which is also equipped with an end fitting 5.

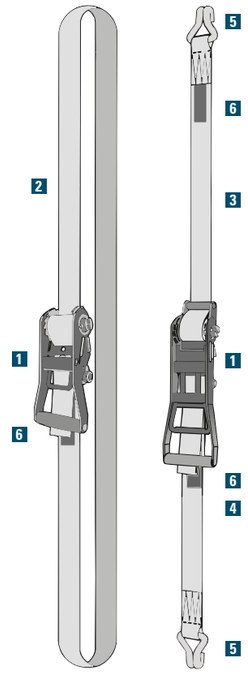
The label
According to the DIN EN 12195-2 standard, fixed and adjustable ends must both be identified using a safety label 6 that provides all of the technical details. The STF (Standard Tension Force) is stated on the label at the fixed end. If this information is missing, the lashing strap may not be used for friction lashing.

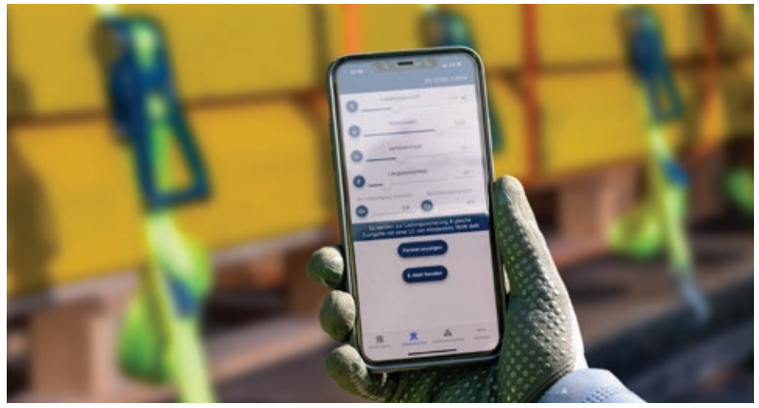
Lashing straps with a CE mark are a widespread problem. Article 7 of the German Product Safety Act [Produktsicherheitsgesetz - ProdSG] prohibits this marking, so a CE mark on the label of a lashing strap means that this lashing strap must be discarded.

6 Label with all mandatory information

Extremely durable
Lashing straps made from polyester can be used in a temperature range from -40°C to +100°C. Even caustic solutions and acids do not generally cause a problem – depending on the concentration and the duration of exposure.

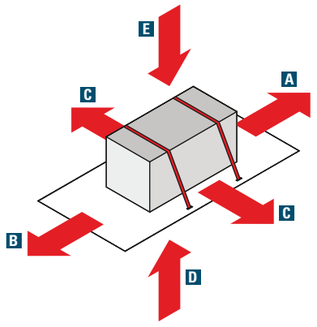
Testing and maintenance
Lashing straps must be tested at least once a year by a competent person. This may even need doing more frequently, depending on the conditions and frequency of use. Maintenance work may only be carried out by the manufacturer or by his representative.





Determining the acceleration values

Characteristics of the modes of transport
Take into account the load distribution, the carrying capacity of the load area, stanchions and carrier's sides, but also the different forces that occur when transporting by ship, truck or train. The first step towards security is selecting the right lashing equipment for your cargo.



Acceleration (in g)		Truck	Train	Ship
A	To the front (C_X)	0,8	4,0	0,4
B	To the back (C_X)	0,5	4,0	0,4
C	To the side (C_Y)	0,5	0,5	0,8
D	Upwards (C_Z)	–	0,3	0,8
E	Downwards (C_Z)	1,0	1,0	1,0

An incredible number of goods are transported on our roads, seas and inland waterways, in the air and by rail every day. These goods must be secured to the load areas so that transport does not present a risk to anyone.

There are three regulations governing the calculation of load control in Germany:
1. Calculation of securing forces VDI 2700 Sheet 2 from July 2014
2. Calculation of securing forces DIN EN 12195-1 in the version from April 2004
3. Calculation of securing forces DIN EN 12195-1 in the version from June 2011

DIN EN 12195-1:2011 is valid throughout Europe. This is rejected in Germany, as it partly reduces the requirements pertaining to safety parameters. However, due to being referenced in the dangerous goods regulations (ADR), it is also indirectly relevant for load control within Germany. The valid regulation in Germany is DIN EN 12195-1:2004 in conjunction with VDI 2700 Sheet 2/2014, as these constitute the currently accepted good engineering practices.

Form-fitting load security
...takes place when the cargo can support itself against bulkheads, ship's walls or stanchions. Here, the bulkheads, ship's walls and stanchions must be able to absorb the forces generated.

Transverse and diagonal lashing constitutes another type of form-fitting load securing. With this method, the lashing equipment and lashing/attachment points must be able to absorb the forces generated. The objective is always to hold the cargo in position. Use form-fitting load security whenever you have the opportunity, as this form of load security is particularly efficient and safe.

Calculating the required tensile force (minimum LC) with form-fitting load security:

- **VDI 2700 Sheet 2:2014 and DIN EN 12195-1:2004**

$$F_R = \frac{m \times g\,(C_x - \mu \times C_z)}{2\,(\cos\alpha \times \cos\beta + \mu \times \sin\alpha)}$$

F_R – min. LC (Lashing Capacity)
μ – Coefficient of friction
α – Vertical lashing angle (to load surface)
β – Horizontal lashing angle (to load surface)
C_x – Acceleration to front and back
C_z – Acceleration upwards and downwards
m – Mass
g – Weight

- **DIN EN 12195-1:2011**

$$F_R = \frac{m \times g\,(C_x - \mu \times f_\mu \times C_z)}{2\,(\cos\alpha \times \cos\beta + \mu \times f_\mu \times \sin\alpha)}$$

F_R – min. LC (Lashing Capacity)
f_μ – 0.75
μ – Coefficient of friction
α – Vertical lashing angle (to load surface)
β – Horizontal lashing angle (to load surface)
C_x – Acceleration to front and back
C_z – Acceleration
m – Mass
g – Weight

With transverse and diagonal lashing, the lashing angles must be observed. Ideally, the vertical angle is between 0° and 60°, the horizontal angle in the longitudinal direction between 20° and 45°.

Indirect load security
...is given when the load is secured against falling or slipping by friction lashing, i.e. by indirect load securing. In the case of friction lashing, two forces act together: the pre-tensioning force and the sliding friction.

Depending on the required pre-tensioning force, the number of lashing straps to be used is determined. The friction resulting from the material pairing of the load and the loading surface reduces the pre-tensioning force required to fix the load to the loading surface. A proven aid is an anti-slip mat under the cargo, which increases the sliding friction.

Calculation of the number of lashing straps required for indirect load securing:

- **VDI 2700 Sheet 2 and DIN EN 12195-1:2004**

$$n = \frac{m \times g\,(C_x - \mu \times C_z)}{k \times \mu \times \sin\alpha \times STF}$$

- **DIN EN 12195-1:2011**

$$n = \frac{m \times g\,(C_x - \mu \times C_z)}{2 \times \mu \times \sin\alpha \times STF} \times f_s$$

n – Number of straps
f_s – 1.1; for road transport in X = 1.25
k – Transfer coefficient (k-factor) (DIN 1.5; VDI 1.8)
μ – Coefficient of friction
α – Vertical lashing angle (to load surface)
C_x – Acceleration to front and back
C_z – Acceleration upwards and downwards
m – Mass
g – Weight

Example:
Friction lashing with a load weighing 20t, placed on an anti-slip mat, m = 0.6, lashing angle at 80°, S_{TF} = 400 daN, k = 1.5, f_S = 1.25

in accordance with **DIN EN 12195-1:2004**

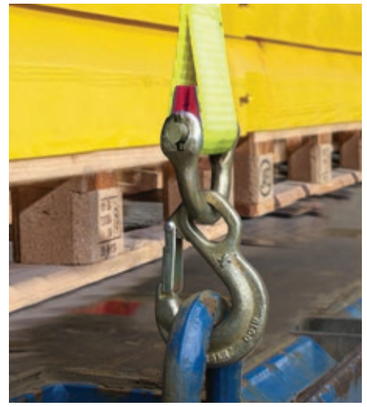
$$= \frac{20000\,(0{,}8 - 0{,}6)}{1{,}5 \times 0{,}6 \times \sin 80° \times 400} = \mathbf{11{,}28 = 12\ lashing\ straps}$$

in accordance with **DIN EN 12195-1:2011**

$$= \frac{20000\,(0{,}8 - 0{,}6)}{2 \times 0{,}6 \times \sin 80° \times 400} \times f_s = \mathbf{10{,}58 = 11\ lashing\ straps}$$

Tipp:
Use our **free lashing force app** for proper load securing. You can find more information on page 128.

- With the TFI, you can verify the pre-tensioning force that is actually attainable
- Verifies that up to 60% fewer lashing straps can be used
- For fixed and adjustable ends
- Very easy to read thanks to signal colour



Achieve the maximum pre-tensioning force in a cost-effective and precise manner.

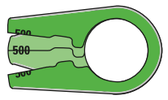


Fig. 1: TFI 500 daN

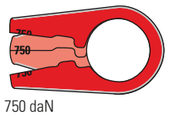


Fig. 2: TFI 750 daN

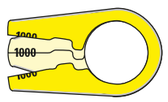


Fig. 3: TFI 1.000 daN

Der TFI – Tension Force Indicator
Normally, when determining the pre-tensioning force, additional electronic devices are used. These are very accurate, but also expensive. More than ten years ago, SpanSet developed a unique mechanical aid – the Tension Force Indicator. The TFI reliably shows the pre-tensioning force that has been achieved – to do so, it is installed directly on the tensioning device. Well-protected and extremely easy to read! Many of our products have already been fitted with TFIs as standard, meaning that expensive measurements are now a thing of the past.

Achieve the maximum pre-tensioning force in a verifiable manner with the TFI
The TFI helps you to make the best possible use of your lashing straps, achieving maximum performance. The pre-tensioning force display makes it simple for you to measure the pre-tensioning force applied and to provide evidence of this with no problems in the event of a check. The two jaws of the TFI close when tension is added. Once the full pre-tensioning force has been reached, the jaws are pressed together (form fit). In this way, you can prove the pre-tensioning force applied in the system quickly and directly. If the lashing strap loses tension during the journey, the jaws of the TFI will not be fully closed, indicating that re-tensioning is necessary in the event of doubt. The Tension Force Indicator, designed for 50 mm-lashing straps, is available in different versions, with 500 (green), 750 (red) and 1,000 (yellow) daN/STF pre-tensioning displays, tailored to the relevant lashing systems. As the TFI design uses signal colours, it also makes it easier to read the pre-tensioning force in poor light conditions.

Additional use of TFI at adjustable end
In addition to the TFI at the fixed end, the TFI can also be used at the adjustable end. For this, there is an adaptor available for the TFI which can be integrated into the current end fittings. In addition, SpanSet has specially designed a delta hook to which the TFI can easily be attached. This results in an additional cost saving, as no adaptor is then required. Alongside the even higher verifiable pre-tensioning force, the K-factor (1.5) is no longer significant, as a lashing force can also be proven at the adjustable end.

In addition to your own safety, the unique TFI guarantees the necessary traceability for the authorities and is also listed as a system component in the GS test descriptions. This means that not only does the Tension Force Indicator from SpanSet ensure greater cost-effectiveness, it also guarantees greater safety when using lashing systems.

SpanSet – Certified Safety

Securing loads – reducing lashing equipment
Simply by using the Tension Force Indicator at the fixed end of the lashing equipment, you can reduce the number of lashing straps significantly. With additional use of the TFI at the adjustable end, it can be proved that up to as much as 60% fewer lashing straps can be used for securing the load. The 2.5t-ErgoABS tensioning ratchet – with a rated STF of 350 daN – is fitted with a TFI 750 at the fixed end as standard. If we consider the k-factor of 1.5, an STF of 1,125 daN is achieved with friction lashing. If an additional TFI 750 is used at the adjustable end, it is even possible to achieve and verify a pre-tensioning force of 1,500 daN.

The following table shows the different STF values with and without TFI, and with resulting number of lashing straps to be used with a 12t-load to be secured. The result of the calculations is convincing.

The result is convincing:
STF values for lashing systems with and without TFI

Lashing strap	LC single direct [daN]	LC strapped around the load [daN]	STF [daN] single direct	STF [daN] strapped around the load k = 1,5	STF [daN] with TFI single direct	STF [daN] with TFI strapped around the load k = 2	Number of lashing straps [12 t-load]
Standard lashing systems (commercially available third-party product)							
2t-lashing strap**	2.000	4.000	280	420	–	–	10
2,5t-lashing strap**	2.500	5.000	250	375	–	–	11
SpanSet lashing systems							
2t-lashing strap* with TFI 500	2.000	4.000	–	–	**500**	**1.000**	**4**
2,5t-lashing strap* with TFI 500	2.500	5.000	–	–	**500**	**1.000**	**4**
2t-Ergo ABS	2.000	4.000	440	660	–	–	6
2,5t-Ergo ABS	2.500	5.000	350	525	–	–	8
2t-Ergo ABS with TFI 750	2.000	4.000	–	–	**750**	**1.500**	**3**
2,5t-Ergo ABS with TFI 750	2.500	5.000	–	–	**750**	**1.500**	**3**

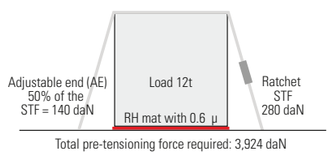
The calculation was carried out with a = 0.8 g, μ = 0.6, a k-coefficient of 1.5 (without TFI) or 2 (with TFIs) and lashing angles

PRACTICAL GUIDELINES

TFI – Tension Force Indicator

Use up to 60% less lashing equipment with the TFI

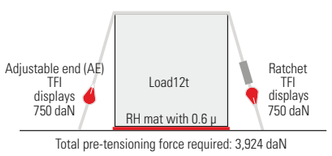
2 t-lashing strap, commercially available, without TFI



Total pre-tensioning force required: 3,924 daN

Result: The pre-tensioning force required is achieved with 10 commercially-available lashing straps

Ergo ABS, 2t with TFI at adjustable end and fixed end



Total pre-tensioning force required: 3,924 daN

Result: The pre-tensioning force required is achieved with 2 Ergo ABS tensioning ratschets.

DIN EN 12195-1, DIN EN 12195-2
and VDI Directive 2700 et seq.

Standards and directives in Germany and Europe

1 The SpanSet company standard, and therefore also our „seal of quality", stands for reliable test results based on DIN EN 12195-2.

2 The GS mark is used to certify that a product complies with the requirements set out in Article 21 of the Product Safety Act. These requirements are set out for textile lashing equipment in DIN EN 12195-2.

For textile lashing equipment, the European standard DIN EN 12195-1 „Calculation of securing forces" and -2, „Web lashing made from man-made fibres" applies. In addition, the information set out in Directive VDI 2700 Sheet 2 is applicable. This must be taken into account in Germany for securing loads with textile lashing systems, alongside the European standard.

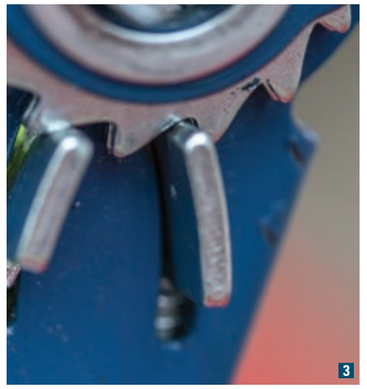
For friction lashing, the principle is that the more force that can be applied to the load with a lashing system, the better. This rule of thumb presumes that the load withstands the forces and is not damaged by the webbing. Due to this finding, lashing systems are designed for a high pre-tensioning force STF (standard tension force) more and more frequently. In many cases, this makes it possible to use fewer tensioning devices to apply the securing force calculated.

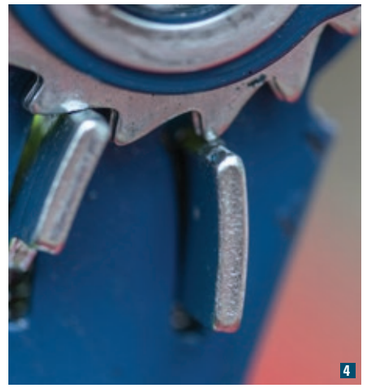
However, high forces also place strain on the webbing and the mechanics of the tensioning devices, and require better tempering of the sprockets. In DIN EN 12195-2, determination of the STF is described, under „6.5.1 Test of pre-tensioning capacity". Nonetheless, DIN EN 12195-2 also leaves scope for interpretation as far as its implementation is concerned, which may result in differing, non-comparable results, depending on how the standard is interpreted.

With regard to the standard DIN EN 12195-1:2011 „Load restraining on road vehicles – Calculation of securing forces", the current opinion in specialist circles is that the requirements pertaining to the safety parameters have been reduced. In certain key points, this standard does not correspond to the safety level that is usual in Germany, and is therefore not used.

Determination of STF value with 50 daN hand force
The secret of the high pre-tensioning force lies in the transmission of force. Long levers, smaller sprocket spacings, double sliders and special half-shafts are used, as is thin webbing. However, measures that make sense for 2 and 2.5 t-lashing systems lead to problems with lighter systems. The STF of a light-weight lashing system with an LC of 400 daN and a webbing width of 25 mm is determined with 50 daN hand force in the same test assembly. Here the standard makes no distinction. As a result, these lashing systems attain STF values that are more than 50% of the LC. This means that they no longer comply with the standard and, among other things, would not be awarded a GS 2.

Under the supervision of the Central Body of the German States for Safety Technology [Zentralstelle der Länder für Sicherheitstechnik - ZLS], the competent testing laboratory experience exchange group responded to this problem and reduced the hand force for light-weight lashing systems to 25 daN. Consequently, the GS mark can once again be awarded for these systems. However, the product must be labelled with the endorsement „based on the standard", as the standard still expressly stipulates that 50 daN of hand force be used to determine the STF. It is difficult to convey this background information to users, particularly as there are still some systems on the market that are incorrectly labelled or are missing the note „based on the standard".


3


4

The STF test in line with the standard
In the STF test, the system is first fixed at both ends, at a variable separation distance from 0.5 to 4.0 m. 1.25 turns of the webbing are then wound onto the spindle 6, and the handle of the tensioning device is positioned at a right angle to the webbing and pre-tensioned with up to 5% of the LC (Lashing Capacity) for the system strength.

Using apparatus, a weight is then used to apply the SHF (Standard Hand Force) of 50 daN. The weight is let down onto the handle that is positioned horizontally. Following this, the weight is raised again and the ratchet handle is moved back to the horizontal position, where it is once again subjected to the force. This process is repeated until such time as it is no longer possible to apply force to the system 5.

Determining the STF value
The difference in force between two sprockets of the tensioning device may easily be 120 daN (sprockets of the tensioning device when caught 3 and at the tip 4. The value to be entered in the calculation is read off 10 seconds after the load is finally removed. Depending on the number of sprockets, the test is repeated five or six times. The maximum and minimum values must be removed from the results and an average must be taken. The STF is then indicated in 2% increments of the LC. If an average value of 385 daN has been determined in the test for a lashing system with an LC of 2,000 daN, a maximum STF of 360 daN can be indicated (increments of 40 daN). A lashing system may only be used for friction lashing if an STF of 10% to a maximum of 50% of the LC has been attained with the test assembly! The values are determined using a „force measuring device", which is currently understood to mean digital and calibrated load cells.

The company standard – standardised test
Standards are important and useful – this is no place for compromises. However, the state of the art is and will remain the benchmark. As an innovative company, SpanSet responds to requirements in the load control sector every day, by means of further developments and innovations in terms of technology and safety.

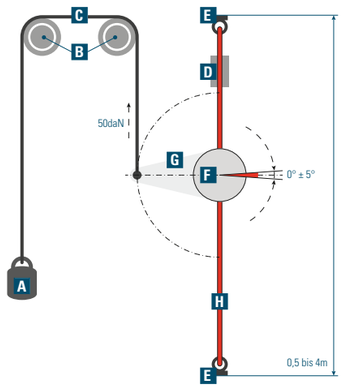
SpanSet has designed test facilities and drawn up test instructions that are used as the basis for carrying out the various standard tests. Documentation of the procedure creates transparency and results in reproducible and reliable performance data determined in accordance with the standard. The test principle and test facilities were developed in collaboration with RWTH Aachen University and agreed with the external test institutes. The outcome: a works standard 1 with reliable test results on the basis of DIN EN 12195-2!

SpanSet – Certified Safety

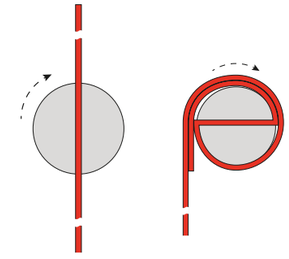
SpanSet STF type testing
and company standard

STF value type testing

5 Execution of test to establish the pre-tensioning capacity (see DIN 12195-2)



A Weight
B Guide pulley
C Rope
D Force transducer
E Attachment point
F Winding shaft/spindle
G Hand lever
H Webbing



6 Winding on the webbing in the STF test

03.1

Heavy duty lashing systems

How a 20-ton boiler stays in place even under full braking

A „difficult“ task: two boilers from Standardkessel Köthen GmbH - one weighing 20 tonnes and 6.15 metres long, the other weighing 17 tonnes and measuring 9.50 metres - had to be secured on a low-loader for transport. With such a massive freight, securing the load is an essential part of the preparations for the journey. The securing and transport of the „heavyweights“ was done by the forwarding company Schrudde from Dorsten in the Ruhr area. For lashing on the side flanks of the low-loader, the transport company used MaXafe heavy-duty ratchets with an extremely low strap elongation of 2%, which means that centrifugal forces during brake manoeuvres are transmitted directly into the lashing system. At the front, the tanks were positively secured against the „gooseneck“ of the low-loader and diagonally lashed. ABS heavy-duty ratchets were used for this, which develop their special benefit at the end of the journey: The anti-belt-slip method (ABS) allows the lashing strap to be released gradually and prevents the strap, which is under tension, from „bouncing“ uncontrollably when the ratchet is opened. „For us as a heavy goods transporter, load control is of paramount importance. Defects in equipment and lashing pose an unmanageable risk of accidents,“ says Schrudde forwarding manager Marco Welz. „With SpanSet we know we are on the safe side. The essential components are coordinated and from a single source.“ This also includes SpanSet secutex. The subsidiary literally contributed the basis for load securing with heavy-duty anti-slip mats.

SpanSet offers a comprehensive range of equipment for safe heavy-duty transport. Robust quality lashing systems with different features, such as the stepwise releasable and self-locking ratchet lever of the ABS ratchets, a label protected in the foil sleeve or the precise automatic seam of the MaXafe, ensure perfect load securing. Supplemented with our protective hoses and anti-slip mats, even the heaviest freight reaches its destination undamaged and accident-free.

SpanSet – Certified Safety

MaXafe heavy-duty ratchet

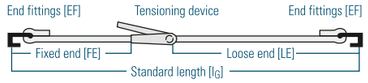
LC 5.000 daN / 55 mm
LC 10.000 daN / 55 mm

- extremely low elongation of less than 2%
- lower own weight
- robust strap construction
- robust, tear-resistant label, protected by
- foil sleeve and webbing overlap
- precise automatic seam
- webbing made of PES/high-performance fibre
- self-locking ratchet lever

DJHS - Snap hook

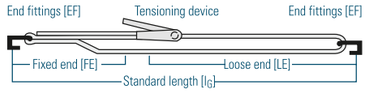
SHD - Delta hook

Two-piece



End fittings [EF]	LC [daN]	Standard length l_G [m]	Strap width [mm]	Expansion [%]	Weight for l_G [kg]	GIN-Number
DJHS	5.000	3	55	< 2	4,5	2005985
DH	5.000	3	55	< 2	6,5	2005988
DJHS	5.000	4	55	< 2	4,7	2005986
DH	5.000	4	55	< 2	6,7	2005989

power-assisted



End fittings [EF]	LC [daN]	Standard length l_G [m]	Strap width [mm]	Expansion [%]	Weight for [kg]	GIN-Number
DJHS	10.000	3	55	< 2	10,3	2005991
DJHS	10.000	4	55	< 2	10,6	2005992

Technical data sheets at: **www.spanset.de**

ABS heavy-duty ratchet

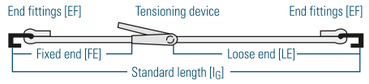
LC 5.000 daN / 50 mm

- self-locking tensioning device, can be released gradually using ABS and equipped with double slider
- low-stretch, wear-resistant webbing with cord edge and marking stripes
- tensioning device coated with epoxy resin
- robust label, resistant to being pulled out, protected by plastic sleeve and webbing insert
- ideal for diagonal lashing of vehicles and machinery

DD - Delta

DH - Delta hook

power-assisted



Standard length l_G [m]	End fittings [EF]	Weight for l_G [kg]	Surface ✓ finished ○ coated	LC [daN]	Standard length [FE] l_G [m]	Strap width [mm]	GIN-Number
4,0	DD	3,9	○	5.000	0,5	50	2004016
4,0	DD	3,9	✓	5.000	0,5	50	2003502
4,0	DH	5,4	○	5.000	0,5	50	2004017
4,0	DH	5,4	✓	5.000	0,5	50	2004013

Technical data sheets at: **www.spanset.de**

ABS heavy-duty ratchet

LC 5.000 daN / 75 mm
LC 10.000 daN / 75 mm

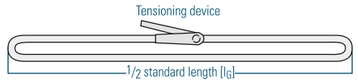
- self-locking tensioning device, can be released gradually using ABS and equipped with double slider
- low-stretch, wear-resistant webbing with cord edge and marking stripes
- tensioning device coated with epoxy resin
- robust label, resistant to being pulled out, protected by plastic sleeve and webbing insert
- ideal for diagonal lashing of vehicles and machinery

DD - Delta

DH - Delta hook

DJH - Claw hook

One-piece

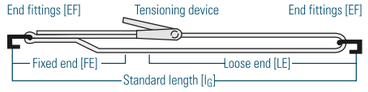


Standard length l_G [m]	Weight for l_G [kg]	End fittings [EF]	LC [daN]	Standard length FE [m]	Strap width [mm]	GIN-Number
4,0	4,3	DD	10.000	0,5	75	2003003
6,0	4,8	DD	10.000	0,5	75	2024151

Two-piece

Standard length l_G [m]	Weight for l_G [kg]	End fittings [EF]	LC [daN]	Standard length FE [m]	Strap width [mm]	GIN-Number
4,0	6,8	DD	5.000	0,7	75	2003496
6,0	7,3	DD	5.000	0,7	75	2024152
4,0	8,7	DH	5.000	0,7	75	2003497
6,0	9,2	DH	5.000	0,7	75	2024153
4,0	5,6	DJH	5.000	0,7	75	2004011
6,0	6,1	DJH	5.000	0,7	75	2024154

power-assisted



Standard length l_G [m]	Weight for l_G [kg]	End fittings [VE]	LC [daN]	Standard length FE [m]	Strap width [mm]	GIN-Number
4,0	9,5	DD	10.000	0,7	75	2003499
6,0	10,5	DD	10.000	0,7	75	2004012
4,0	8,1	DH	10.000	0,7	75	2003005
6,0	9,1	DH	10.000	0,7	75	2003500

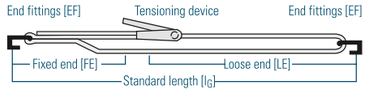
ABS heavy-duty ratchet

LC 12.500 daN / 75 mm

- tensioning device can be released gradually, self-locking and equipped with double slider
- epoxy resin-coated tensioning device made from hardened material and with reinforced bars
- robust label, resistant to being pulled out, protected by plastic sleeve and webbing insert
- reliable lashing force of up to 12,500 daN
- with TFI as standard

DH - Delta hook

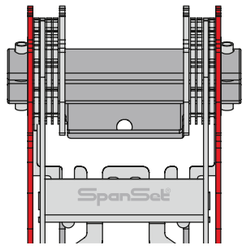
power-assisted



Standard length l_G [m]	Weight for l_G [kg]	End fittings [VE]	LC [daN]	Standard length FE [m]	Strap width [mm]	GIN-Number
4,0	16,5	DH	12.500	0,7	75	2003004
6,0	17,5	DH	12.500	0,7	75	2003498

Technical data sheets at: **www.spanset.de**

Reinforced bar



This high-performance ratchet is further reinforced by a double bar, meaning that the load is distributed between three points rather than just two. This results in extremely high loading capacity and stability.

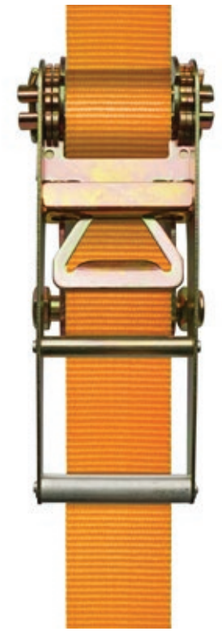
500daN TFI | ABS | TFI | EPX | 4%

SpanSet Certified Safety

SpannFix heavy-duty ratchet

LC 5.000 daN / 75 mm
LC 10.000 daN / 75 mm

- yellow chrome-plated tensioning device
- self-locking ratchet lever
- wear-resistant webbing
- reliable lashing force of up to 5,000 daN
- label that is resistant to being pulled out, protected by webbing insert

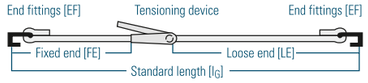


DJH - Claw hook

SDH - Triangle hook

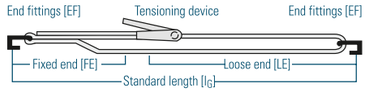
DH - Delta hook

Two-piece



Standard length l_G [m]	Weight for l_G [kg]	End fittings [EF]	LC [daN]	Standard length FE [m]	Strap width [mm]	GIN-Number
4,0	6,2	DJH	5.000	0,7	75	2003498
6,0	6,8	DJH	5.000	0,7	75	2024155
4,0	8,8	SDH	5.000	0,7	75	2003505
6,0	9,4	SDH	5.000	0,7	75	2024156
4,0	8,3	DH	5.000	0,7	75	2003504
6,0	8,9	DH	5.000	0,7	75	2024157

power-assisted



Standard length l_G [m]	Weight for l_G [kg]	End fittings [VE]	LC [daN]	Standard length FE [m]	Strap width [mm]	GIN-Number
4,0	12,2	DH	10.000	0,7	75	2003503
6,0	12,8	DH	10.000	0,7	75	2024159

Technical data sheets at: **www.spanset.de**

03.2

Pull-down ratchet systems

Premium pull-down ratchet with built-in safety

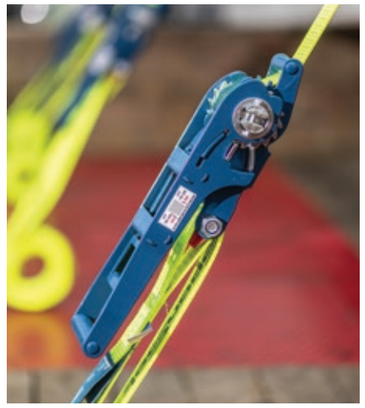
Heinz-Josef Pennings is one of those company owners in the transport industry who gets behind the wheel with enthusiasm - preferably when the low-loader goes on tour. However: „Driving with heavy freight can only be fun if the load is one hundred percent secured. That's where we've relied on SpanSet for years and are absolutely convinced by the ErgoABS towing ratchets." For him, it is literally not far to the right equipment. The headquarters of Transporte Pennings and SpanSet are only a stone's throw away from each other. The drivers used the full SpanSet range to secure a concrete bridge pier weighing almost 20 tonnes and 12 metres long on the low-loader. The linchpin was ErgoABS tension ratchets. The premium product has a low-stretch and wear-resistant webbing. The tensioning element itself is coated with epoxy resin and thus robust and durable. The particularly long lever of the pull ratchet significantly improves handling. Users feel this not only in their backs! Thanks to the ergonomic tension ratchet, a pre-tensioning force of 750 daN can be built up with little physical effort. The standard integrated Tension Force Indicator (TFI) shows when this value is reached. The Anti Belt System (ABS) is an important safety feature. With it, the drivers release the pre-tensioning force in a controlled and gradual manner before unloading. In this way, they defuse dangerous situations that could dangerous situations that can arise when parts that are not tip-proof fall from the loading area. In order to protect the lashing straps from the rough concrete surface and edges, protective sleeves from SpanSet's subsidiary Secutex, coated on one side with polyurethane, were used for the pier transport. subsidiary Secutex (LSP-SF1). Anti-slip mats made of solid rubber were also included.

Whether excess length or excess width, whether wood, steel or concrete: As soon as it gets really heavy and large, the Transporte Pennings team is at its best. Precisely because the professionals think in huge dimensions, they are sometimes downright petty. When it comes to securing loads, they pay every detail and only use top quality.

SpanSet – Certified Safety

ErgoABS pull-down ratchet
2.000/50 with S_{TF} 440

- sitted with TFI pre-tensioning display as standard, pre-tensioning force of 750 daN can be achieved and read off
- ABS ratchet can be released gradually, self-locking and equipped with double slider
- tensioning principle and extended ratchet lever for ergonomic and improved transmission of force
- low-stretch, wear-resistant webbing with cord edge and marking stripes
- tensioning device coated with epoxy resin
- robust label, resistant to being pulled out, protected by plastic sleeve and webbing insert



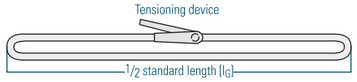
SDH - Delta hook

DJH - Claw hook

DJHS - Hook and keeper

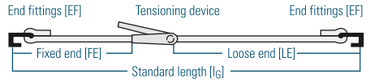
RH - Rave hook

One-piece



Standard length l_G [m]	Weight for l_G [kg]	LC [daN]	Strap width [mm]	GIN-Number
8,0	3,0	4.000	50	2003009

Two-piece



Standard length l_G [m]	Weight for l_G [kg]	End fittings (EF)	LC [daN]	S_{TF} [daN]	S_{TF} with 750er-TFI [daN]	Standard length FE [m]	Strap width [mm]	GIN-Number
8,0	4,1	SDH	2.000	440	750	0,5	50	2003506
8,0	3,4	DJH	2.000	440	750	0,5	50	2003507
8,0	3,7	DJHS	2.000	440	750	0,5	50	2004018
8,0	3,3	RH	2.000	440	750	0,5	50	2004019

Technical data sheets at: **www.spanset.de**

750daN TFI · ABS · EPX · 4%

ErgoABS pull-down ratchet
2.500/50 with STF 350

- fItted with pretensioning indicator TFI, thus achievable and readable pretensioning force of 500 daN, simply direct
- ABS ratchet can be released gradually, self-locking and equipped with double slider
- tensioning principle and extended ratchet lever for ergonomic and improved transmission of force
- Low-stretch, wear-resistant webbing with marking stripes
- tensioning device coated with epoxy resin
- robust label, resistant to being pulled out, protected by plastic sleeve and webbing insert

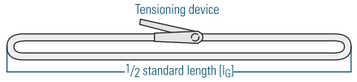
SDH - Delta hook

DJH - Claw hook

DJHS - Hook and keeper

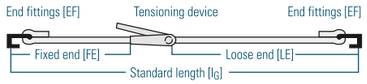
RH - Rave hook

One-piece



Standard length l_G [m]	Weight for l_G [kg]	LC [daN]	Strap width [mm]	GIN-Number
8,0	3,2	5.000	50	004020

Two-piece



Standard length l_G [m]	Weight for l_G [kg]	End fittings [EF]	LC [daN]	S_{TF} [daN]	S_{TF} with 750er-TFI [daN]	Standard length FE [m]	Strap width [mm]	GIN-Number
8,0	4,3	SHD	2.500	350	750	0,5	50	2004021
8,0	3,6	DJH	2.500	350	750	0,5	50	2004022
8,0	3,9	DJHS	2.500	350	750	0,5	50	2004475
8,0	3,5	RH	2.500	350	750	0,5	50	2004476

Technical data sheets at: **www.spanset.de**

750daN TFI · ABS · EPX · 4%

SpanSet Certified Safety

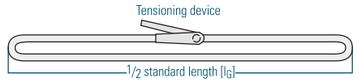
SpannFix Ergo pull-down ratchet RL
2.500/50 with S_{TF} 500

- Self-locking ratchet lever
- Pull system and extended ratchet lever for ergonomic and better power transmission
- tear-resistant label protected by webbing overlapping

DJHS - Hook and keeper

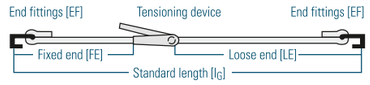
DJH - Claw hook

One-piece



Standard length l_G [m]	Weight for l_G [kg]	LC [daN]	Strap width [mm]	GIN-Number
8,0	2,6	5.000	50	2024231
10,0	2,9	5.000	50	2024232

Two-piece



Standard length l_G [m]	Weight for l_G [kg]	End fittings [EF]	LC [daN]	S_{TF} [daN]	Standard length FE [m]	Strap width [mm]	GIN-Number
8,0	3,4	DJHS	2.500	500	0,5	50	2024233
10,0	3,6	DJHS	2.500	500	0,5	50	2024234
8,0	2,9	DJH	2.500	500	0,5	50	2024235
10,0	3,2	DJH	2.500	500	0,5	50	2024236

Technical data sheets at: **www.spanset.de**

03.3

Pull-up ratchet systems

How pressure ratchets in the craft sector make everyday life easier and safer

Caution fragile! Glass windows and glass doors on the loading area are among the most sensitive goods. Perfect equipment and a lot of user know-how are required to secure them. Fenster Knaut GmbH from Geilenkirchen is one of the real experts in this field. The „First Window Partner Gold Level“ of the premium manufacturer Internorm relies on pressure ratchets, clamp locks and edge protectors from SpanSet for load securing. „We secure our customers’ new windows and doors with the utmost care. Damage would not only cause unnecessary costs, but also quickly result in construction delays,“ says company founder and managing director Stephan Knaut. The mobile crane that often comes up to the construction site poses an additional challenge. Knaut also obtains the material for load securing from SpanSet. The diagonal lashing with four Robusta pressure ratchets gives the crane a secure hold during transport. With the galvanised and chromated ratchet, the Knaut fitters generate high pre-tensioning forces. The integrated Tension Force Indicator (TFI) shows whether these are sufficient. It is an indispensable aid for Stephan Knaut and his team: „The TFI gives us even more security during transport. We can see immediately if we need to lash down.“

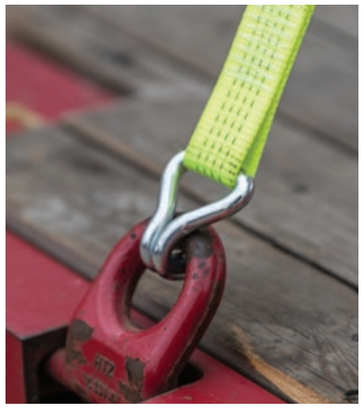
Whether tie-down or diagonal lashing: SpanSet’s varied range of pressure ratchets offers ergonomic solutions for load securing. The anti-belt-slip technology in the ABS ratchets ensures safe and controlled release of the belts. The TFI pretensioning indicator is included as standard. The SpanSet Robusta ratchet made of high-strength steel is coated with an impact-resistant epoxy resin coating. Handy 1 t lashing systems and 400 kg ratchet lashing straps as „lightweights“ round off the range. The low-stretch and wear-resistant webbing allows a long service life and thus an economical use of the high-quality pressure ratchets „made in Germany“.

SpanSet – Certified Safety

ABS pull-up ratchet

LC 2.000 daN /50 mm with STF 440
LC 2.500 daN /50 mm with STF 350

- tensioning device coated with epoxy resin
- robust label, resistant to being pulled out, Ratchet can be released gradually, self-locking and equipped with double slider
- low-stretch, wear-resistant webbing with marking stripes
- fItted with pretensioning indicator TFI, thus achievable and readable pretensioning force of 500 daN, simply direct



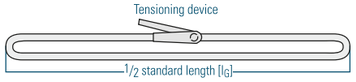
SDH - Delta hook

DJH - Claw hook

DJHS - Hook and keeper

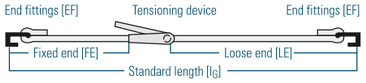
RH - Rave hook

One-piece



Standard length l_G [m]	Weight for l_G [kg]	LC [daN]	Strap width [mm]	GIN-Number
8,0	2,5	4.000	50	2003019
8,0	2,8	5.000	50	2004038

Two-piece



Standard length l_G [m]	Weight for l_G [kg]	End fittings (EF)	LC [daN]	S_{TF} [daN]	S_{TF} with 500er-TFI [daN]	Standard length FE [m]	Strap width [mm]	GIN-Number
8,0	3,5	SHD	2.000	440	500	0,5	50	2003520
8,0	3,0	DJH	2.000	440	500	0,5	50	2003521
8,0	3,3	DJHS	2.000	440	500	0,5	50	2004036
8,0	2,8	RH	2.000	440	500	0,5	50	2004037
8,0	3,8	SHD	2.500	350	500	0,5	50	2004039
8,0	3,3	DJH	2.500	350	500	0,5	50	2004040
8,0	3,6	DJHS	2.500	350	500	0,5	50	2004481
8,0	3,1	RH	2.500	350	500	0,5	50	2004482

Technical data sheets at: **www.spanset.de**

500daN TFI · ABS · EPX · 4%

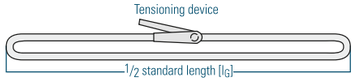
SpannFix-ABS pull-up ratchet RL
2.500/50 with S_{TF} 350

- ratchet can be released gradually, self-locking and equipped with double slider
- tear-resistant label protected by webbing overlapping
- optionally with pretensioning indicator TFI, thus achievable and readable pretensioning force of 500 daN, simply direct
- robust webbing with marking stripes

DJHS - Hook and keeper

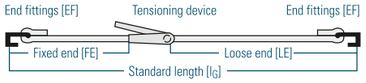
DJH - Claw hook

One-piece



Standard length l_G [m]	Weight for l_G [kg]	LC [daN]	Strap width [mm]	GIN-Number
8,0	2,8	5.000	50	2024231
10,0	3,0	5.000	50	2024232

Two-piece



Standard length l_G [m]	Weight for l_G [kg]	End fittings (VE)	LC [daN]	S_{TF} [daN]	Standard length FE [m]	**optional** with 500er-TFI [daN]	Strap width [mm]	GIN-Number
8,0	3,8	DJHS	2.500	350	0,5	500	50	2024233
10,0	4,1	DJHS	2.500	350	0,5	500	50	2024234
8,0	3,5	DJH	2.500	350	0,5	500	50	2024235
10,0	3,8	DJH	2.500	350	0,5	500	50	2024236

Technical data sheets at: **www.spanset.de**

03.3 PULL-UP RATSCHET SYSTEMS

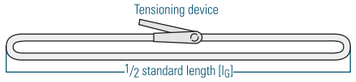
Robusta pull-up ratchet
2.500/50 with S_{TF} 350

- fine toothing enables higher pretensioning forces with less effort
- the self-locking ratchet lever prevents subsequent opening during driving operation
- foil sleeve and webbing overlap protect the label from abrasion
- with tension force indicator TFI, thus achievable and readable pre-tensioning force of 500 daN
- epoxy resin coating protects against rusting
- robust webbing with marking stripe

DJHS - Hook and keeper

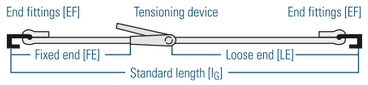
DJH - Claw hook

One-piece



Standard length l_G [m]	Weight for l_G [kg]	LC [daN]	Strap width [mm]	GIN-Number
8,0	2,4	5.000	50	2024217
10,0	2,6	5.000	50	2024222

Two-piece



Standard length l_G [m]	Weight for l_G [kg]	End fittings (EF)	LC [daN]	S_{TF} [daN]	**optional** with 500er-TFI [daN]	Standard length FE [m]	Strap width [mm]	GIN-Number
8,0	3,1	DJHS	2.500	350	500	0,5	50	2024218
10,0	3,4	DJHS	2.500	350	500	0,5	50	2024219
8,0	2,8	DJH	2.500	350	500	0,5	50	2024220
10,0	3,1	DJH	2.500	350	500	0,5	50	2024221

Technical data sheets at: **www.spanset.de**

500daN TFI · EPX · 4%

SpanSet Certified Safety

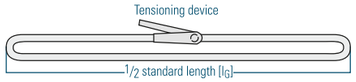
SpannFix pull-up ratchet RL1807
2.500/50 with S_{TF} 350

- ratchet can be released gradually, self-locking and equipped with double slider
- tear-resistant label protected by webbing overlapping
- optionally with pretensioning indicator TFI, thus achievable and readable pretensioning force of 500 daN, simply direct
- robust webbing with marking stripes

DJHS - Hook and keeper

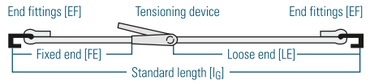
DJH - Claw hook

One-piece



Standard length l_G [m]	Weight for l_G [kg]	LC [daN]	Strap width [mm]	GIN-Number
8,0	2,1	5.000	50	2024237
10,0	2,4	5.000	50	2024238

Two-piece



Standard length l_G [m]	Weight for l_G [kg]	End fittings (EF)	LC [daN]	S_{TF} [daN]	optional with 500er-TFI [daN]	Standard-length FE [m]	Strap width [mm]	GIN-Number
8,0	2,8	DJHS	2.500	350	500	0,5	50	2024239
10,0	3,1	DJHS	2.500	350	500	0,5	50	2024240
8,0	2,5	DJH	2.500	350	500	0,5	50	2024241
10,0	2,8	DJH	2.500	350	500	0,5	50	2024242

Technical data sheets at: **www.spanset.de**

ProXafe pull-up ratchet

LC 1.000 daN / 35mm with STF 440

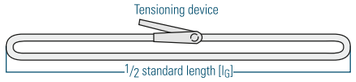
- epoxy resin coated clamping element
- extra wide ratchet handle for particularly good ergonomics
- robust, tear-resistant label, protected by foil sleeve and webbing overlap
- robust webbing with marking stripe

SHS - Snap hook

DJH - Claw hook

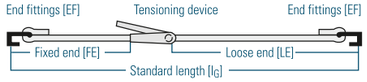
RH - Rave hook

One-piece



Standard length l_G [m]	Weight for l_G [kg]	LC [daN]	Strap width [mm]	GIN-Number
4,0	0,7	2.000	35	2003020
6,0	0,7	2.000	35	2015259

Two-piece



Standard length l_G [m]	Weight for l_G [kg]	End fittings (EF)	LC [daN]	S_{TF} [daN]	Standard length FE [m]	Strap width [mm]	GIN-Number
4,0	1,0	SHS	1.000	440	0,3	35	2003522
6,0	1,0	SHS	1.000	440	0,3	35	2015260
4,0	1,2	DJH	1.000	440	0,3	35	2003523
6,0	1,2	DJH	1.000	440	0,3	35	2015261
4,0	0,9	RH	1.000	440	0,3	35	2004041
6,0	0,9	RH	1.000	440	0,3	35	2015262

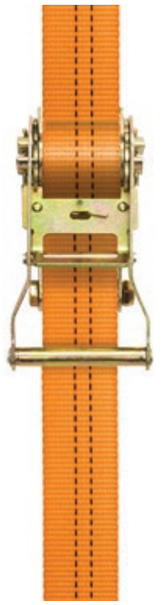
Technical data sheets at: **www.spanset.de**

EPX

SpannFix pull-up ratchet

LC 1.000 daN / 35mm with STF 260

- extra wide ratchet handle for particularly good ergonomics
- tear-resistant label protected by webbing overlap
- robust webbing with marking stripes



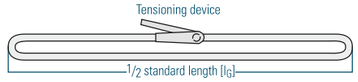
SHS - Snap hook

DJH - Claw hook

RH - Rave hook

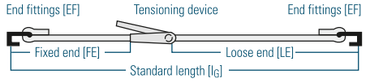
JH - Claw hook, single wire

One-piece



Standard length l_G [m]	Weight for l_G [kg]	LC [daN]	Bandbreite [mm]	GIN-Number
4,0	0,7	2.000	35	2003024

Two-piece



Standard length l_G [m]	Weight for l_G [kg]	End fittings (EF)	LC [daN]	S_{TF} [daN]	Standard length FE [m]	Strap width [mm]	GIN-Number
4,0	1,0	SHS	1.000	260	0,3	35	2004047
4,0	1,2	DJH	1.000	260	0,3	35	2003530
4,0	0,9	RH	1.000	260	0,3	35	2003531
4,0	1,1	JH	1.000	260	0,3	35	2024160

Technical data sheets at: **www.spanset.de**

Spannfix pull-up ratchet
500/50 with STF 230

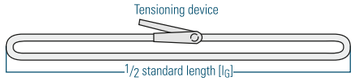
- extra wide ratchet handle for particularly good ergonomics
- tear-resistant label protected by webbing overlap

SHS - Snap hook

RH - Rave hook

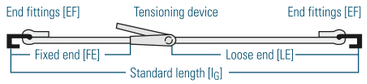
DJH - Claw hook

One-piece



Standard length l_G [m]	Weight for l_G [kg]	LC [daN]	Strap width [mm]	GIN-Number
4,0	0,7	1.000	50	2003025
6,0	0,7	1.000	50	2024160

Two-piece



Standard length l_G [m]	Weight for l_G [kg]	End fittings (EF)	LC [daN]	STF [daN]	Standard length FE [m]	Strap width [mm]	GIN-Number
4,0	1,0	SHS	500	230	0,3	50	2004048
6,0	1,0	SHS	500	230	0,3	50	2024161
4,0	1,1	RH	500	230	0,3	50	2003532
6,0	1,1	RH	500	230	0,3	50	2024162
4,0	1,0	DJH	500	230	0,3	50	2003533
6,0	1,0	DJH	500	230	0,3	50	2024163

Technical data sheets at: **www.spanset.de**

ProXafe pull-up ratchet
500/25 with TF 160

- epoxy resin coated clamping element
- robust, tear-resistant label, protected by foil sleeve and webbing overlap

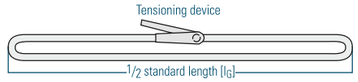
SHS - Snap hook

RH - Raven hook

DJH - Claw hook

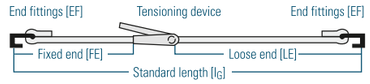
AP - Anchor plate

One-piece



Standard length l_G [m]	Weight for l_G [kg]	LC [daN]	Strap width [mm]	GIN-Number
4,0	0,5	1.000	25	2003021
6,0	0,5	1.000	25	2024164

Two-piece



Standard length l_G [m]	Weight for l_G [kg]	End fittings (EF)	LC [daN]	TF [daN]	Standard length FE [m]	Strap width [mm]	GIN-Number
4,0	0,8	SHS	500	160	0,3	25	2004044
6,0	0,8	SHS	500	160	0,3	25	2024165
4,0	0,7	RH	500	160	0,3	25	2003524
6,0	0,7	RH	500	160	0,3	25	2024166
4,0	0,7	DJH	500	160	0,3	25	2004043
6,0	0,7	DJH	500	160	0,3	25	2024167
4,0	0,6	AP	500	160	0,3	25	2003525
6,0	0,6	AP	500	160	0,3	25	2024168

Technical data sheets at: **www.spanset.de**

EPX

03.3 PULL-UP RATSCHET SYSTEMS

ProXafe pull-up ratchet
400/25 with TF 140

- clamping elements optionally yellow chromated, epoxy resin coated or as stainless steel ratchet with 13 % chrome content in the steel for permanent rust protection
- tear-resistant label protected by webbing overlap

SH - S-hook

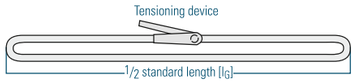
DJH - Claw hook

SHS - Snap hook

AP - Anchor plate

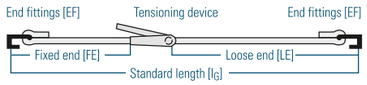
One-piece

ID1419035700



Typ		Standard length l_G [m]	Weight for l_G [kg]	LC [daN]	Strap width [mm]	GIN-Number
yellow chom.	1	4,0	0,4	800	25	2003026
blue	2					2016726
Niro	3					2012531
yellow chom.	1	6,0	0,4	800	25	2024170
blue	2					2016727
Niro	3					2012532

Two-piece



Typ		Standard length l_G [m]	Weight for l_G [kg]	End fittings (EF)	LC [daN]	TF [daN]	Standard length FE [m]	Strap width [mm]	GIN-Number
yellow chom.	1	4,0	0,6	SH	400	140	0,3	25	2003534
blue	2								2016730
Niro	3								2012535
yellow chom.	1	6,0	0,6	SH	400	140	0,3	25	2024170
blue	2								2016734
Niro	3								2012539
yellow chom.	1	4,0	0,6	DJH	400	140	0,3	25	2003535
blue	2								2016728
Niro	3								2012533
yellow chom.	1	6,0	0,6	DJH	400	140	0,3	25	2024171
blue	2								2016732
Niro	3								2012537
yellow chom.	1	4,0	0,7	SHS	400	140	0,3	25	2004049
blue	2								2016729
Niro	3								2012534
yellow chom.	1	6,0	0,7	SHS	400	140	0,3	25	2024172
blue	2								2016733
Niro	3								2012538
yellow chom.	1	4,0	0,5	AP	400	140	0,3	25	2024174
blue	2								2016731
Niro	3								2012536
gelb chom.	1	6,0	0,5	AP	400	140	0,3	25	2024173
blue	2								2016735
Niro	3								2012540

EPX

03.4

Cam buckle lashing systems

How the advantages of the cam lock straps are optimally used by the NATO

Stand still! At the NATO air base in Geilenkirchen-Teveren, this command also applies to reconnaissance aircraft. But only when their deployment is not currently required. The heavy Airbus aircraft wait at the military airfield on the German-Dutch border for their next flight to crisis areas around the globe. To prevent them from moving without permission on the ground, 150 cm long brake wedge beams block their way. Even though the beams ensure standstill: they themselves are constantly on the move from one place to another on the military site. For this purpose, they are stored on Euro pallets. Clamp lock lashing straps from SpanSet are used to secure the loads for the short distances. Ratchets with high lashing forces are not necessary. Much more important to the users is the simple opening and tensioning of the straps - this happens several times every day. The clamp lock lashing straps are loosened briefly to remove the required brake wedge beams from the pallet. After that, a few hand movements are enough to keep the rest of the load in shape.

Fixing, bundling, fastening, inclined and diagonal lashing - SpanSet clamp lock lashing straps are used „everywhere“. The inexpensive and lightweight all-purpose tools prove their worth when securing gas cylinders in motorhomes as well as when fixing roll containers in the retail trade. They are also in demand for bundling building materials and securing luggage in the boot of a car. The injection-moulded aluminium clamp locks do not rust and are easy to handle. SpanSet offers the straps in several widths and lengths and with different end fittings.

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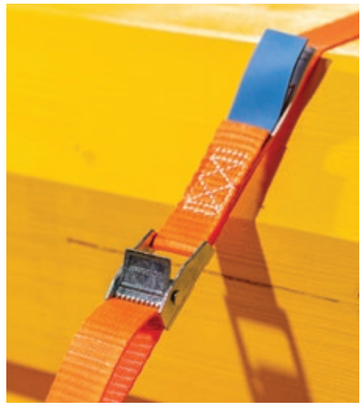
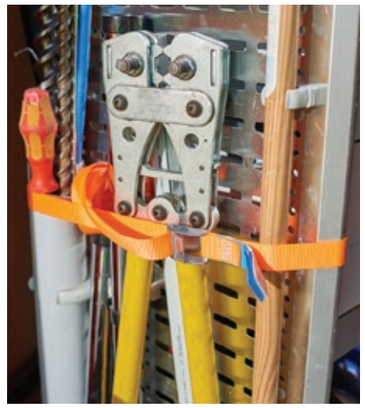
Cam buckle lashing strap

LC 125 daN / 25 mm





- high fitting accuracy due to optimal width and thickness of the webbing, matched to the respective clamp lock
- tear-proof, protected label

SH - S-hook

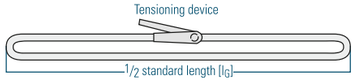
FH - Pallet hook

AP - Achor hook

SHS - Snap hook

One-piece

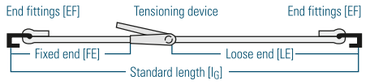
VL20067



Standard length l_G [m]	Weight for l_G [kg]	LC [daN]	Strap width [mm]	GIN-Number
4,0	0,2	250	25	2003031
6,0	0,3	250	25	2024178

Two-piece

VL20068



Standard length l_G [m]	Weight for l_G [kg]	End fittings [EF]	LC [daN]	Standard length FE [m]	Strap width [mm]	GIN-Number
4,0	0,4	SH	125	0,3	25	2003544
6,0	0,5	SH	125	0,3	25	2024179
4,0	0,4	FH	125	0,3	25	2003545
6,0	0,5	FH	125	0,3	25	2024180
4,0	0,3	AP	125	0,3	25	2004058
6,0	0,4	AP	125	0,3	25	2024181
4,0	0,5	SHS	125	0,3	25	2004059
6,0	0,6	SHS	125	0,3	25	2024182

Technical data sheets at: **www.spanset.de**

Cam buckle lashing strap

LC 250 daN / 25 mm

- high fitting accuracy due to optimal width and thickness of the webbing, matched to the respective clamp lock
- tear-proof, protected label

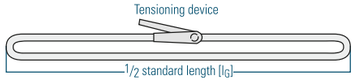
SHS - Snap hook

DJH - Claw hook

SH - S-hook

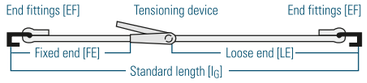
FH - Pallet hook

One-piece



Standard length l_G [m]	Weight for l_G [kg]	LC [daN]	Strap width [mm]	GIN-Number
4,0	0,3	500	25	2003030
6,0	0,4	500	25	2024183

Two-piece

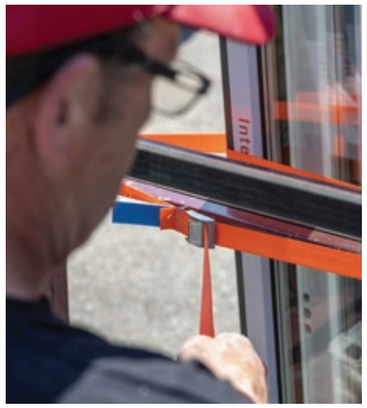


Standard length l_G [m]	Weight for l_G [kg]	End fittings [EF]	LC [daN]	Standard length FE [m]	Strap width [mm]	GIN-Number
4,0	0,6	SHS	250	0,3	25	2003543
6,0	0,7	SHS	250	0,3	25	2024184
4,0	0,5	DJH	250	0,3	25	2003542
6,0	0,6	DJH	250	0,3	25	2024185
4,0	0,5	SH	250	0,3	25	2004055
6,0	0,6	SH	250	0,3	25	2024186
4,0	0,5	FH	250	0,3	25	2004056
6,0	0,6	FH	250	0,3	25	2024187

Technical data sheets at: **www.spanset.de**

03.4 CAM BUCKLE LASHING SYSTEMS

Cam buckle lashing strap
LC 375 daN / 35 mm



- high fitting accuracy due to optimal width and thickness of the webbing, matched to the respective clamp lock
- tear-proof, protected label

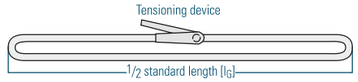
SHS - Snap hook

DJH - Claw hook

RH - Rave hook

One-piece

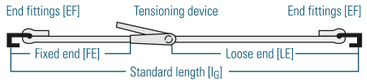
VL20065



Standard length l_G [m]	Weight for l_G [kg]	LC [daN]	Strap width [mm]	GIN-Number
4,0	0,4	750	35	2003029
6,0	0,5	750	35	2024190

Two-piece

VL20066



Standard length l_G [m]	Weight for l_G [kg]	End fittings [EF]	LC [daN]	Standard length FE [m]	Strap width [mm]	GIN-Number
4,0	0,7	SHS	375	0,3	35	2003541
6,0	0,8	SHS	375	0,3	35	2024191
4,0	0,9	DJH	375	0,3	35	2003540
6,0	1,0	DJH	375	0,3	35	2024192
4,0	0,6	RH	375	0,3	35	2004053
6,0	0,7	RH	375	0,3	35	2024193

Technical data sheets at: **www.spanset.de**

Cam buckle lashing strap

LC 500 daN / 50 mm

- high fitting accuracy due to optimal width and thickness of the webbing, matched to the respective clamp lock
- tear-proof, protected label

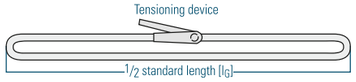
SHS - Snap hook

DJH -Claw hook

FH - Flat J hook

One-piece

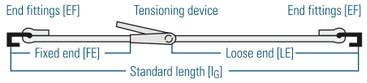
VL19021



Standard length l_G [m]	Weight for l_G [kg]	LC [daN]	Strap width [mm]	GIN-Number
4,0	0,5	1.000	50	2003028
6,0	0,6	1.000	50	2024194

Two-piece

VL19022



Standard length l_G [m]	Weight for l_G [kg]	End fittings [EF]	LC [daN]	Standard length FE [m]	Strap width [mm]	GIN-Number
4,0	0,8	SHS	500	0,3	50	2003539
6,0	0,9	SHS	500	0,3	50	2024195
4,0	0,8	DJH	500	0,3	50	2003538
6,0	0,9	DJH	500	0,3	50	2024196
4,0	0,9	FH	500	0,3	50	2004051
6,0	1,0	FH	500	0,3	50	2024197

Technical data sheets at: **www.spanset.de**

03.5

Anti-slip mats

How an anti-slip coating also fulfils the friction values at minus 20 degrees.

Australia is planning something huge: the construction of a pumped storage power plant for 350,000 megawatt hours. For this purpose, two reservoirs, which are 27 kilometres apart, will be connected via a tunnel system. During the day, solar-powered pumps will transport the water from Talbingo to Tangara further upstream. When the solar systems „sleep“ at night, the water is released and powers the underground power plant. Before that can happen, the tunnel tube has to be built - from 130,000 concrete elements. Twelve trucks with up to three trailers transport them to the construction site. Three segments are stacked on each of them, which raises the issue of load securing. The responsible persons paid special attention to the anti-slip coating on the girder frame between the trailer and the lower concrete element. A material was required for these so-called trailer bolsters, withstand high mechanical loads and strong climatic fluctuations. fluctuations. Even at minus 20 degrees and icy icy surfaces, it still had to guarantee a coefficient of friction of 0.25. The choice fell on secuGrip 90 in combination with a base made of secutex with perforated plate reinforcement. In elaborate test series SpanSet in Australia and SpanSet secutex in Geilenkirchen have proven the Geilenkirchen have demonstrated that their product meets the demanding specifications with regard to the coefficients of friction, even under the most - even under the most adverse weather conditions. The mats were firmly bolted to the steel girders on which the concrete elements rest during transport. Other products from SpanSet are also involved in the safe transport of the tunnel components: MaXafe heavy-duty lashing straps and edge protection elements.

SpanSet secutex has developed a range of anti-slip mats and materials. Depending on the requirements, permanent coatings or freely layable elements are recommended. The effect of solid rubber mats, spray coatings, granulate mats and pads always results from the interaction of several factors such as surface load, substrate, temperature, humidity. But this much is clear: what the anti-slip mat generates in terms of friction by itself does not have to be worked out by muscle power on the ratchet when lashing down.

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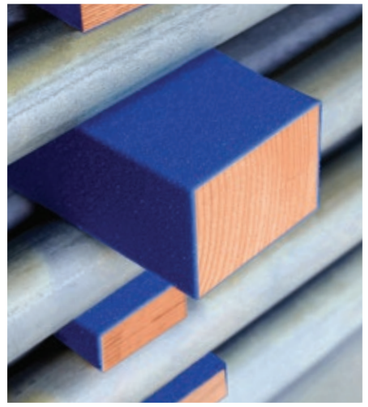
03.5 ANTI-SLIP MATS

secugrip 90 – Anti-slip laminates
secugrip 75 – Direct coating



- secugrip is acid, alkali and UV resistant
- reusable
- DEKRA-certified
- conforms to VDI guideline 2700 ff
- individual cuts possible

secugrip 90 – self-adhesive anti-slip laminates

secuGrip 90 are self-adhesive anti-slip laminates that you can apply yourself. The 2 to 4 mm thick secuGrip coatings have a high coefficient of friction and are extremely abrasion-resistant. Installation is as simple as it is easy: the back is coated with acrylate adhesive and holds on many different surfaces.

The acrylic adhesive itself:
- has a high bonding strength
- is temperature and weather resistant
- is insensitive to moisture
- ensures tension equalisation

Product code	Width max. [mm]	Length max. [mm]	thickness [mm]
secugrip 90	1.000	2.000	2

secugrip 75 – directly coated surfaces

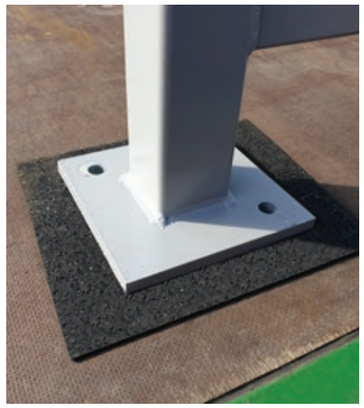
The coated wooden beams do not absorb oil or water and are perfectly suitable as aids in the field of load securing due to their officially proven anti-slip properties. The wooden beams become much more robust through the coating with secuGrip, our customers praise the drastically improved service life, even in tough transport use.

Directly sprayed surfaces can be created seamlessly and without joints, these surfaces seal the substrate permanently against water and air. The secuGrip coating can also be sprayed directly onto hooks and other constructions. Just get in touch with us!

Product code	Width max. [mm]	Length max. [mm]	thickness [mm]
secugrip 75	1.000	2.000	2

03.5 ANTI-SLIP MATS

Grip-S – Solid rubber mat
Grip-G – Granulate mat



SpanSet Grip-S – the reusable anti-slip matting

With the SpanSet Grip-S you increase the coefficient of friction μ for various friction combinations to 0.6 and more. This value has been certified by TÜV Süd. On request, we will send you a copy of the certificates with the coefficients of friction so that you can prove the coefficients of friction of the Grip-S at any time and present your basis of calculation for load securing. Of course, the Grip-S complies with VDI 2700 sheets 14 and 15.

Highly compressed, fibre-reinforced solid rubber with a closed surface structure - this is what makes our anti-slip mat so effective. There are no broken-off parts and thus no „ball bearing effect“ where abrasive material is pushed between the load and the mat, thus reducing the coefficient of friction. Insensitive to operating materials and easy to clean, the anti-slip mat withstands the stresses of daily use and is reusable.

Format [mm]	Thickness [mm]	Weight [kg]	GIN-Number
200 × 200	2,0	0,1	2006040
5.000 × 266	2,0	3,0	2006041
20.000 × 150	2,0	6,7	2006042
200 × 200	9,0	0,4	2017039
5.000 × 266	9,0	13,7	2006044

You can also find more information at: www.spanset-grip.de Special dimensions available on request.

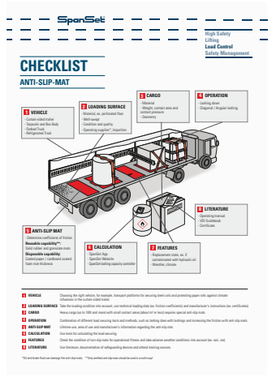
SpanSet Grip-G – granulate matting

The universally applicable anti-slip mat consists of rubber granulates bonded under pressure and complies with VDI 2700 ff. Friction values of μ 0.6 and more are achieved for the common material combinations and documented by test certificates. In addition to the standard cuts, the anti-slip mat can be customised in various sizes and thicknesses.

Format [mm]	Thickness [mm]	Weight [kg]	GIN-Number
200 × 200	8	0,3	2006046
5.000 × 250	8	8,2	2006047
20.000 × 150	3	7,7	2006048

Special dimensions available on request; further information at **www.spanset.de**

ASM-Checklist
download for free



You can find all the points to be taken into consideration when using anti-slip mats in the SpanSet ASM checklist, which is available to download free of charge at **www.spanset.de**.

03.6

Load control and covering nets

How PaXafe separation nets create safety in and on the vans

Polygonvatro employs around 3,000 specialists for building restoration after fire and water damage at 80 locations in Germany. With their service vehicles, the employees transport a lot of material to the work sites. While the tools are placed in the front third of the loading area, machines are placed in the rear. These are often dehumidifiers in the format of desk containers. In order to make optimal use of the capacities of the vans, additional equipment is stacked on top of the machines. In the event of heavy braking, the machines and all other freight items must not slide forward. Therefore, a stable parcelling of the interior is required for professional load securing. The solution proposed and implemented by SpanSet is a PackNet partition net specially adapted for Polygonvatro. It takes on the function of a permanent partition wall that is firmly attached to the trolley and is practically never removed. Metal rods on the right and left keep the net in shape, and clamping lock straps provide the necessary tension. For years, a large parcel service provider has been using a similar design of these SpanSet nets in its delivery vehicles. „Safety first! With the PackNet, our teams gain the certainty that they are on the road with reliable and certified load securing," says Stefan Schaffrath, head of Polygonvatro's Heinsberg branch. And he adds: „During a police check, the blood pressure remains in the normal range."

SpanSet has developed a range of securing, separating and covering nets for vans, flatbed vehicles, cars and trailers. The nets are available in different designs for tie-down and direct lashing. Several variants are also available with regard to mesh size. All products from the PaXafe range of VDI 2700 sheet 3.3.

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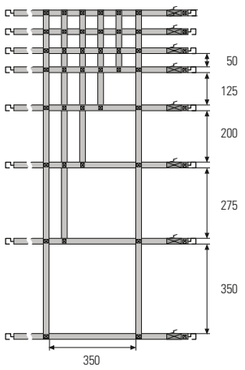
03.6 LOAD CONTROL AND COVERING NETS

PackNet separation nets

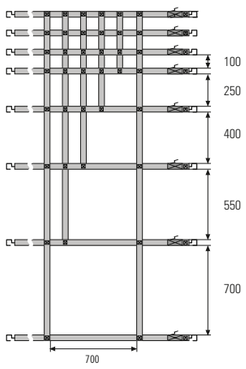
- individual mesh size
- individual certification
- as load securing net
- fulfil all requirements of the
- VDI guideline 2700 sheet 3.3
- tear-resistant, protected label

Individual mesh size

Open mesh size in mm for 25 mm webbing



Open mesh size in mm for 50 mm webbing



Individual separation nets – linked safety customised to your requirements

Loose goods such as packages and small packets are secured in an optimal manner within the vehicle using the SpanSet PackNet. PackNet prevents the cargo from sliding, without damaging it. PackNet webbing nets are anchored with the end fittings in the lashing tracks and secured with alternative tensioning devices. In between there is a whole range of variations for individual box-body vehicles, cargo spaces and luggage compartments.

Allow SpanSet to put together the ideal combination of webbing width (25 mm or 50 mm), mesh size, end fittings and tensioning devices for your application.

Simply enter the required dimensions and equipment in the table, scan or photograph them and request a non-binding quote via our contact form at **www.spanset.de**.

End fittings and tensioning devices that can be combined

Tensioning devices [TD]

2008145
Cam buckle
for 25 mm

2000275
Ratchet
for 25 mm

2008146
Ratchet
for 50 mm

2008144
Cam buckle
for 50 mm

End fittings [EF]

2008172
for track with
small bars

2008189
for track with
slotted holes

2025539
for keyhole

2008234
for round hole
(20 mm)

2008152
for various

We require the following information in your enquiry:

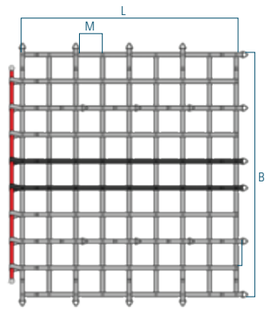
Total Width [cm]	Total Height [cm]	Webbing Width [mm]	Mesh Width [mm]	Gap Mesh Size [mm]	Tensioning Device (TD)	End Fitting (EF)	Number (TD)	Number (EF)
Example:								
237	205	50	100	100	2000275	2008234	3	6

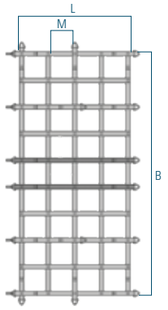
Technical data sheet for the tensioning devices and end fittings available at: **www.spanset.de**

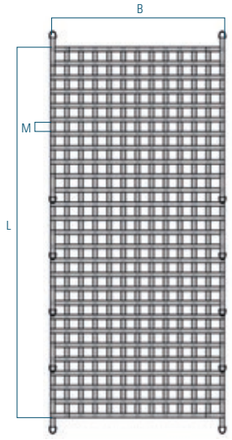
03.6 LOAD CONTROL AND COVERING NETS

PaXafe load control nets

- Mesh size:
  50 x 50 mm, 125 x 125 mm, 250 x 250 mm
- Satisfy all requirements of the
  VDI Directive 2700 part 3.3.
- BG-certified as load control net
- tear-resistant, protected label







PaXafe load control nets

PaXafe nets for trucks and vans are universal load securing equipment with which you can secure divided and palletised loads quickly and easily. The load securing nets can be used in tie-down and also direct lashing methods. The standard nets consist of the basic net and the Spannfix lashing straps, equipped with snap hooks on the vehicle side and pointed hooks on the net side. All basic nets can be extended to fit exactly with the respective supplementary nets or easily reduced in size by folding the net over.

- Complete set with quick release straps and optional locking bar
- Mesh size: 250 x 250 mm
- total net: LC 3.000 daN

With the **PaXafe nets for cars and station wagons**, you form load units and thus achieve form-fitting load securing. The load securing nets are available in two sizes and two mesh widths and offer safe transport even for small loads. One set consists of a Load control Net incl. 4 clamp lock lashing straps, which allow the net to be attached quickly and easily.

- Complete set incl. 4 clamp lock straps
- Material: stitched 25 mm webbing
- Mesh size: 50 x 50 mm and 125 x 125 mm
- LC 800 daN total

03.6 LOAD CONTROL AND COVERING NETS

PaXafe Light – knotted covering nets

- DEKRA-certified as a cover net and marked with the corresponding label.
- Material: braided polyethylene
- Edge beading: 8 mm

1 PaXafe Light covering net incl. 4 clamp lock straps

2 PaXafe Light covering net without lock straps

knotted covering nets – so nothing can fly around

The knotted PaXafe covering nets made from water-resistant polyethylene ensure rapid load control. They are certified by DEKRA and equipped with an identification label that is firmly sewn on. The robust covering nets are available in various sizes and have a knot strength of 74.25 daN, as well as a static mesh breaking strength of 200 daN. Whether you use them for your car or van, trailer, flat-bed truck or container, you can travel in safety with the knotted PaXafe nets. They can easily be combined with the load control nets and constitute a useful addition to the PaXafe modular nets.

PaXafe Light covering net incl. 4 clamp lock straps

External dimensions [mm]	Mesh size [mm]	Material thickness [mm]	Colour	GIN-Number
1300 x 1600	45	2,5	black	2024198

PaXafe Light covering net without lock straps

External dimensions [mm]	Mesh size [mm]	Material thickness [mm]	Colour	GIN-Number
1500 x 2200	45	2,5	green	2006034
1500 x 2700	45	2,5	green	2006035
2500 x 3500	45	2,5	green	2006036
3500 x 5000	45	2,5	green	2006037
3500 x 6000	45	2,5	green	2006038

SpanSet Certified Safety

03.7

EasyLash

How EasyLash ensures more efficiency for cargo ships

One of the world's largest manufacturers of steel coils in Korea decided in favour of the SpanSet Dynamic Load System for quality and cost reasons. For two years, systems from different manufacturers were carefully examined and tested. In the end, they decided on the SpanSet system, consisting of a 40 millimetre wide textile belt in combination with the Dynamic Load Ratchet. Currently, 15 cargo ships on the Korea-Japan route are using the SpanSet system. For the future, up to 50 cargo ships are expected. The main advantage, according to those responsible, is the reusability and the possibility of re-tensioning, which does not work with conventional systems. Even in the heaviest seas, the SpanSet system has thus proven to be a reliable partner.

The EasyLash range is ideally suited for the worldwide transport of goods by container, rail and ship, enabling you to secure your products optimally for export. The high-quality components are an economical solution for secure one-way lashing. The principle is as simple as it is well thought-out: the thermofixed straps and buckles needed for strapping go on the journey, the tensioning elements stay with you. This variant is optimal when the load simply needs to arrive safely at its destination and the securing means are no longer required. For reusable use, SpanSet has developed the Dynamic Load System with reusable ratchet. Here, the ratchet is threaded onto the webbing and remains on the freight during transport. At the destination, the ratchet can then be released again without cutting the webbing and is thus available again for the next transport.

But whether as a one-way or reusable lashing or as a Dynamic Load System - all EasyLash products combine high quality with easy handling and a good price-performance ratio. Secure your load easily and reliably, especially in containers and for rail transport - with SpanSet EasyLash.

SpanSet – Certified Safety

EasyLashtex
EasyLash buckels

- optimally suited for the transport of
- goods by container, rail and ship
- protects sensitive goods
- weather-resistant and corrosion-free
- system strengths of up to 7,500 daN
- high strength with low dead weight
- easy handling

EasyLashtex – the ideal alternative to steel straps

EasyLashtex, woven from high-strength PES fibres, is designed for the highest loads during transport and achieves the same strength as steel straps - but is much lighter. Injuries caused by metal edges or rebounding steel straps and contamination of the load with rust stains can be ruled out. EasyLashtex does not corrode and is suitable for the most sensitive surfaces. The heat setting ensures a low elongation of less than 7%. With the matching EasyLash buckles, system strengths of up to 7,500 daN can be achieved.

Name	Strap width [mm]	Bandfestigkeit [daN]	with strap buckle	EF [Back]	Run length per bag [m]	Weigh per EF [kg]	GIN-Number
EL 25 MBL	25	1200	B8, 80005, 1422	1	400	10,5	2003068
EL 35 MBL	35	3000	BF10, 80009	1	300	21,5	2003582
EL 40 MBL orange	40	5000	01436	1	200	20,2	2003583
EL 49 MBL 1900	49	1900	01950, 80010	1	300	12,0	2004089
EL 49 MBL 4800	49	4800	80010, 1420	1	200	18,9	2004090
EL 49 MBL 6000	49	6000	1437	1	200	23,4	2004091


2003070


2003587


2003586


2004093


2004094


2004095


2004096


2004097


2024199


2024200

EasyLash buckels

Clamp buckles are made from a single, robust metal pin. There are no burrs or seams that rub against the webbing. Frame buckles are made of bent, welded round steel or stamped, embossed sheet metal.

With this form of buckle you can achieve significantly higher strengths. All buckles are protected against corrosion and are weatherproof.

Designation	Suitable for strap type	Strap strength [daN]	Strap width [mm]	Surface	Qty [Box]	Weight per box [kg]	GIN-Number
B8	EL 25 MBL	1200	25	galvanized	250	9,0	2003070
1422	EL 25 MBL	1200	25	powder-coated	1	0,03	2003587
8005	EL 25 MBL	1200	25	chromated	300	16,2	2003586
BF10	EL 35 MBL	3000	35	phosphated	250	11,2	2004093
80009	EL 35 MBL	3000	35	chromated	200	18,8	2004094
01436	EL 40 MBL	5000	40	chromated	30	8,4	2004095
01950	EL 49 MBL	1900	49	powder-coated	50	1,2	2004096
80010	EL 49 MBL	1900/4800	49	chromated	100	22,5	2004097
1420	EL 49 MBL	4800	49	chromated	1	0,23	2024199
1437	EL 49 MBL	6000	49	chromated	50	19,5	2024200

Mechanical strap tensioner
Dynamic Load Ratchet

- The Dynamic Load System can be retightened at any time
- re-usable clamping element
- mechanical strap tensioner with cutting device
- Low dead weight

Mechanical strap tensioner – Clamping and cutting in one device

The ideal transmission ratio of the strap tensioners enables high pre-tensioning forces with little effort. The tensioners have a cutting device and are available for strap widths of 25, 40 or 50 mm.

Name	for max. strap width [mm]	Dimensions [mm]	Weight [kg]	Integrated cutting device	GIN-Number
Spanner 25	25	320 x 185 x 105	1,5	yes	2003584
Spanner 40	40	330 x 180 x 95	2,5	yes	2003585
Spanner 50	50	320 x 185 x 105	2,6	yes	2003069

Dynamic Load Ratchtet – the re-usable lashing system

The Dynamic Load Ratchet makes lashing even easier and faster. The yellow chromated ratchet has a ribbed double web in which the strap can be threaded very easily. Unlike the mechanical strap tensioner, the ratchet travels with the load. This means that you are able to retighten the strap at any time. In addition, you don't need any additional buckles to connect the strap for strapping.

The Dynamic Load Ratchet is compatible with the orange EasyLashtex webbing, which has a minimum breaking strength of 6,000 daN in strapping. Individual printing of the strap is possible on request. An excellent application for this system is, for example, the securing of coils in ships. For packed coils, the strap can even be used without an additional protective sleeve.

Name	for max. strap width [mm]	Dimensions [mm]	Weight (kg)	GIN-Number
Dynamic Load Ratchet with adapter	40	198 x 85 x 54	1,0	2004092

03.8

Load control for curtainsiders

TruXafe fulfils the applicable requirements and rules of technology according to VDI 2700 and § 22 Para. 1 StVO

For flexible loads, TruXafe is a reliable and proven system for load securing via the body form closure on curtainsiders. Test institutes have tested the SpanSet solution several times with different loads and confirmed that TruXafe as additional equipment for vehicle bodies meets the applicable requirements and rules of technology for securing loads. TruXafe enables quick and reliable securing of big bags (FIBC), stacked bagged goods on pallets and other flexible packaging. The professional combination of side slat, locking beam and belt diagonal results in a highly stable and at the same time gentle fixation of load units that are not dimensionally stable. Depending on the load and the requirements, the loading space of the trailer is divided into chambers by means of TruXafe, which allow a form-fit load securing. An easy-to-use, patented system diverts the forces of the side slats into the vehicle chassis without overloading the lashing points provided. Due to its profile cross-section, the TruXafe side slat has four times the permissible load capacity of a conventional aluminium insert slat. In many applications, two rows of side slats are sufficient. In addition to the form fit, the time saved during loading and unloading is another plus point.

Carl Franz was significantly involved in the development of TruXafe. As a member of the VDI standards committee, the LaSi specialist, who is known and respected far beyond the borders of Germany, was involved in the development of TruXafe.His word is well known in the industry. Numerous positively conducted dynamic practical tests conducted by test institutes confirm that TruXafe meets the requirements of VDI 2700 and § 22 Para.1 StVO.

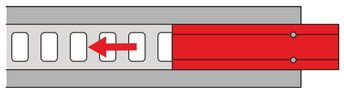
SpanSet – Certified Safety

03.8 LOAD CONTROL FOR CURTAINSIDER

TruXafe side slats
TruXafe locking beams

- Secures loads weighing up to 2 t per 1 m of structural length
- Quick to install, easy to store
- DEKRA certified: complies with all the requirements of the Germany Road Traffic Ordinance [StVO], e.g. Article 22, paragraph 1, with Directive 2700 et seq. and with DIN EN 12195-1 /2
- Satisfies all the requirements through form fitting

Stabilise the side walls: This means that the TruXafe insertion slat can absorb up to four times more load than conventional insertion slats. Specifically, this can be **400 daN central point load and 800 daN surface load**. At only 11.7 kg, the robust aluminium insertion slat is easy for you to handle. The length of the side slats can be adapted to your vehicle thanks to the screwed head pieces.



TruXafe side slats – absorb up to four times more load

Standard length [mm]	Height [mm]	Depth [mm]	Weight [kg]	Point load in centre [daN]	Surface load [daN]	Long top part [mm]	GIN-Number
3.050	175	35	11,7	400	800	270	2003064

In addition to the insertion slats, you give your load additional support with the TruXafe locking beams. They can withstand loads of up to 2,500 daN. The beams, which weigh just under 12 kg, are simply hooked with the hook ends into the grid holes of the insertion slat. This ensures that the force is transmitted both in the direction of travel and across the direction of travel.

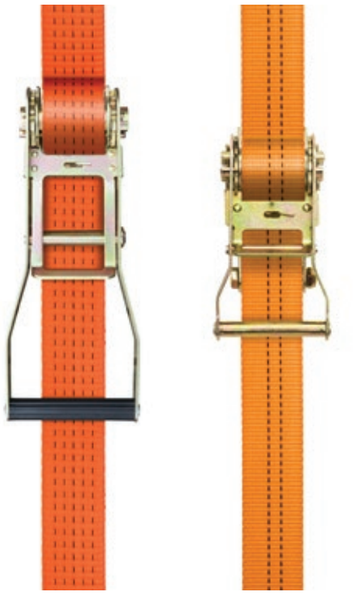
TruXafe locking beams – additional hold for loads

Standard length [mm]	Height [mm]	Depth [mm]	Weight [kg]	Surface load [daN]	GIN-Number
2.540	127	80	11,5	2.500	2003065

03.8 LOAD CONTROL FOR CURTAINSIDER

TruXafe diagonal lashing

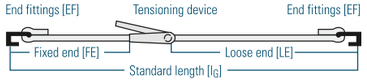
- Proven tensioning strap construction
- DEKRA certified: fulfils all requirements of the StVO, e.g. § 22 Abs.1, the VDI guideline 2700 ff and the DIN EN 12195-1 /2
- Significant increase in body strength



DJH - Claw hook

RH - Rave hook

TruXafe diagonal lashing

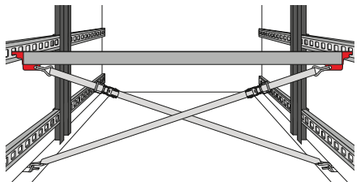


Standard length l_G [m]	Weight for l_G [kg]	End fittings (EF)**	LC [daN]	Colour webbing	Standard length FE [m]	Strap width b [mm]	GIN-Number
3,5	1,8	DJH	1.500	orange	0,3	35	2024278
3,5	1,5	DJH + RH	1.500	orange	0,3	35	2024279
3,5	3,4	DJH	2.500	orange	0,5	50	2024281
3,5	3,0	DJH + RH	2.500	orange	0,5	50	2024282

Technical data sheets at: **www.spanset.de**

Deflecting forces diagonally

You can take the final step to optimise your load control with the TruXafe diagonal lashing straps. They are very easy to attach: at the top in the standard suspension eyes of the locking beams and at the bottom in the lashing point or at the outer edge of the load surface. Tensioned diagonally, they transfer the lateral loads into the vehicle floor and thereby relieve the strain on the side slats and stanchions.



Certified safety

TruXafe convinces through efficiency and cost-effectiveness. In terms of safety, TruXafe also meets the high requirements for securing loads on curtainsiders. SpanSet has a large number of TruXafe individual certificates in accordance with DIN EN 12642 Appendix B. A wide variety of loads have been successfully tested in road trials and certified by DEKRA:

- **Palletised goods, drums and big bags,**
- **tissue papers and soft paper rolls**
- **Beverages on Euro pallet,**
- **beverage barrels 30 l + 50 l,**
- **corrugated board IBC and octabins**
- **Bagged goods on pallets,**
- **swap bodies, etc.**

All TruXafe certificates can be found on our website at **www.spanset.de**. There you can also watch the TruXafe film showing some test drives.

03.9

ACCESSORIES

How an accessory avoids uncontrolled opening of container doors

You never know! Before opening an import container, the same question comes up every time: Has the consignor stowed the goods properly? If the load has not been properly secured on its journey, which can sometimes cover thousands of kilometres, there is an increasing risk. It happens time and again that parts slip during loading in the port or in heavy seas. And they may then press against the container walls from the inside with extreme force. When the lock is opened, the steel door can swing open in an uncontrolled manner and cause considerable injury to employees. CTUXafe from SpanSet defuses such situations. The one-piece lashing strap is tensioned between the locking linkage of the two door halves. It's as easy as putting on a trouser belt," say users. The maximum number of centimetres that the container door can open is determined directly on the container door by means of a buckle. The lashing strap forms a stable barrier that withstands a pressure of up to 1.5 daN. This corresponds to 1.5 tonnes pushing against the door. The gap allows the worker to assess the „situation" in the container. If any load has slipped, he decides whether and which safety precautions need to be taken to open the container completely. There are no unpleasant surprises.

To protect its warehouse staff from injuries when unloading containers, an international furniture chain has made the use of CTUXafe mandatory and adapted its work instructions accordingly. No employee is allowed to open a container without the safety device.

SpanSet – Certified Safety

3.9 ACCESSOIRES

edge protection
KaSi Plus, UWi Plus and accessoires

- Protects the webbing from rough surfaces and sharp edges and the load from pressure marks caused by the webbing
- For lashing systems with webbing straps measuring 50 mm in width
- Accessory for positioning and storage

Edge protection for the transport of paper rolls
The innovative KaSi Plus edge protector protects the sensitive edge of the paper rolls by means of a hollow groove when securing them for transport with lashing straps. The strap guides via the inwardly shifted edge deflection and the raised upper strap deflection additionally relieve the sensitive paper roll edge and distribute the surface pressure over a larger contact area. Pressure points and damage to the paper rolls are thus effectively avoided.

KaSi Plus edge protection

Name	Webbing width (mm)	Length x Width x Height (mm)	Weight (kg)	GIN-Number
Edge protection KaSi Plus	55	200 x 150 x 145	0,3	1055985

Edge protection for straight loads
The UWI Plus was specially developed for particularly sensitive loads. The interior cutout of the edge protector provides particular protection for the delicate edges of your cargo. The practical webbing strap guide simplifies handling and ensures optimal transfer of force and force distribution. The UWI Plus is suitable for lashing systems using webbing straps that are 50 mm wide. What is more, the edge protector can be stored in a particularly space-saving manner as it is stackable – a perfect aid for delicate loads.

UWI Plus edge protection

Name	Strap width (mm)	Length x Width x Height (mm)	Weight (kg)	GIN-Number
Edge protection UWI Plus	50	200 x 150 x 145	0,3	1055848

Useful accessories
For higher positioning points, the telescopic rod with positioner enables easy attachment. The KaSi Plus is simply placed on the positioner and attached with the telescopic rod at the appropriate height.

The KaSi Plus is stackable and space-saving. With the KaSi Plus rack, you also always have a tidy loading area. The rack with space for 10 KaSi Plus edge protectors can be hooked into the side insertion slat, for example.

KaSi Plus and UWI Plus accessoires

Name	Length x Width x Height (mm)	Weight (kg)	GIN-Number
Telescopic rod		0,4	2012552
Positioner for Telescopic rod		0,1	2012554
Rack	465 x 220 x 210	0,9	2012553

3.9 ACCESSOIRES

Edge protection UWI and LOX Ratchet support

- Protects the strap from rough surfaces and sharp edges and the load from pressure points caused by the strap
- For lashing systems with a strap width of 25 - 50 mm
- Reliable protection of the load

The universal edge protector
The UWI is an especially economical edge protector for everyday applications in the transport sector. It is quick to attach and protects the fabric of the webbing strap from sharp edges and rough surfaces, and the cargo from pressure points caused by the webbing. The UWI is particularly suitable for relieving the strain on the load edge for straight loads where the securing forces are transferred over a large area. In addition, the smooth, polished webbing strap deflector improves the manner in which the securing force is transferred.

UWI edge protection

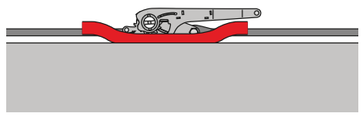
Name	Webbing width (mm)	Length x Width x Height (mm)	Weight (kg)	GIN-Number
Edge protection UWI	50	145 x 135 x 90	0,1	1020992

Inexpensive solution for belts up to 35 mm
The LOX edge protection bracket made of polypropylene is an inexpensive solution for webbing straps up to 35 mm wide. Two slots ensure easy attachment of the lashing straps. Quickly mounted, the LOX protects the load and lashing equipment from rough surfaces and sharp edges.

LOX edge protection

Name	Webbing width (mm)	Weight (kg)	GIN-Number
Edge protection LOX	35	0,1	2019406

Reliable protection for the ratchet
Movement during transport can leave marks on painted or polished surfaces, for example. The ratchet pad made of robust polyurethane prevents this simply and effectively. The pad is easy to thread onto the ratchet and cannot slip during transport.



Ratchet support

Name	Length x Width [mm]	Applicable webbing width [mm]	GIN-Number
Ratchet support	170 x 90	35	2024246
Ratchet support	205 x 96	50	2024247
Ratchet support	295 x 125	75	2024249

3.9 ACCESSOIRES

LaWi long edge protector

- easy handling due to large contact surface
- protects webbing and load
- helps to bridge gaps in the load
- can be shortened as required
- Suitable for all webbing widths
- LaWi1637 with optional webbing guide

How a loose bundle of cargo becomes a solid package

Thanks to the honeycomb structure, the long edge angles LaWi 1636 and LaWi 1637 made of polyethylene are very torsion-resistant and enable the bridging of gaps in the load. Sensitive loads such as roof tiles, prefabricated concrete parts, planed wooden beams or even palletised barrels are no problem because the inner groove in the long edge angle effectively protects the load edge. The large edge rounding also protects the webbing and increases the pre-tensioning force due to better force transmission. The large contact surface makes it easy to attach to the load. The LaWi can also be shortened for smaller loads.

Long edge protector LaWi 1636

Name	Colour	Length** [mm]	Height x Width [mm]	Inner bearing surface	weight*** ca. [kg]	GIN-Number
LaWi 1636	black	800	210 x 120	180 x 90	2,0	2003036
LaWi 1636	black	1200	210 x 120	180 x 90	3,0	2003546
LaWi 1636	black	2400	210 x 120	180 x 90	6,0	2003547

**Observe tolerance of +/- 20 mm; ***Please observe weight tolerance of 20%.

Long edge protector with optional webbing guide

The red long edge protector LaWi 1637 is available with an optional webbing guide that is simply inserted into the long edge protector. The webbing cannot slip during lashing and remains in the desired position. If not required, the LaWi 1637 can also be used without the strap guide.

Long edge protector 1637

Name	Colour	Length** [mm]	Height x Width [mm]	Inner bearing surface	Weight*** ca. [kg]	GIN-Number
LaWi 1637	red	800	140 x 100	120 x 80	1,1	2003037
LaWi 1637	red	1200	140 x 100	120 x 80	1,6	2003548
LaWi 1637	red	2400	140 x 100	120 x 80	3,3	2003549

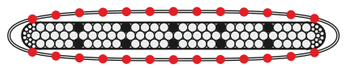
Webbing guide LaWi 1637*	blue	-	-	-	-	2004060

*4 items per package; **Observe tolerance of +/- 20 mm; ***Please observe weight tolerance of 20%.

3.9 ACCESSOIRES

Protective sleeves

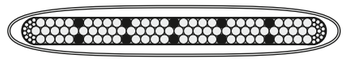
The sliP - slide protection - offers high cut resistance through the use of a high-performance fibre and protects the webbing from sharp-edged loads. The woven-in skids allow the webbing to slide over the edge of the load without abrasion.



sliP - the protective sleeve with skids

Name	Applicable webbing width [mm]	VE Length [mm]	GIN-Number
sliP-50	35 - 50	5000	2024267

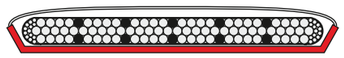
Thanks to its especially smooth, low-abrasion interior, the PF/2 can quickly be pushed onto any webbing strap. On rough edges or on stones or concrete slabs, the PF/2 provides extremely effective protection against fraying and damage to the strap. You can roll up the PF/2 with the webbing strap so that you immediately have it to hand for the next use. It could scarcely be easier.



Protective Sleeve PF/2

Name	Applicable webbing width [mm]	VE Length [mm]	GIN-Number
PF/2-35	35	1000	2024264
PF/2-50	50	1000	2024265
PF/2-75	75	1000	2024266

The LSP-SF1 has a robust polyurethane coating on one side that protects the lashing strap from sharp edges and rough surfaces. The polyurethane side is placed against the load and protects the lashing strap against chafing and damage. The LSP-SF1 remains on the strap and is simply rolled up with it. The protective sleeve is particularly useful when transporting prefabricated concrete parts, steel or metal components.

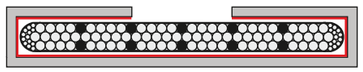


Protective Sleeve LSP-SF1

Custom cutting also possible

Name	Applicable webbing width [mm]	VE Length [mm]	GIN-Number
LSP-SF1-25	25	5000	2024268
LSP-SF1-35	35	5000	2024269
LSP-SF1-50	50	5000	2024270
LSP-SF1-75	75	5000	2024271

This protective clip protects lashing equipment and loads and makes your work even easier. Thanks to its coated fabric layer and the opening slot at the rear, it can quickly be pushed onto a strap and removed again. The lashing strap slides better in the fabric, which makes securing the load easier. The SC protective clip is preferably used where it is decided on a case-by-case basis whether protective sleeves are needed.

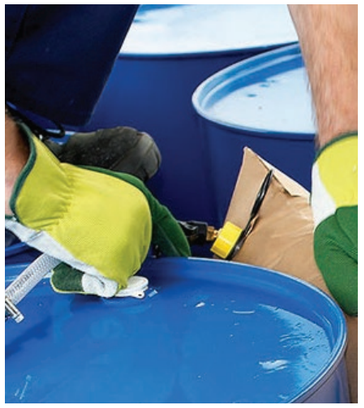


Protective clip SC – protection for webbing strap and load

Name	Length [cm]	Applicable webbing width [mm]	GIN-Number
SC-35-50	50	35	2024272
SC-35-100	100	35	2024273
SC-50-50	50	50	2024274
SC-50-100	100	50	2024275
SC-50-75	50	75	2024276
SC-75-100	100	75	2024277

3.9 ACCESSOIRES

Airbags AirflexPaper



- High load capacity due to particularly strong kraft paper
- for stowage gaps up to 400 mm
- enables large-area, form-fitting filling of the transport gaps
- time-saving and effective
- Airtight inner film made of polyethylene

The AirflexPaper airbag is a universal and economical load securing device offering simple and intuitive handling with optimal impact and vibration damping. The airbags, which are designed for a maximum pressure of 0.6 bar, consist of an airtight polyethylene inner lining that is fitted with a valve. This is covered by one of more layers of kraft paper. With the right amount of air and when used in the correct position between the cargo, the airbag ensures that a large area of the stowage gap is filled and therefore secures the load against sliding.

Kraft paper airbag with PE inner lining

Dimensions [mm]	Stowage gap [mm]	Filling pressure [bar]	Burst pressure* [bar]	Qty per pallet / Weight [kg]	GIN-Number
Kraft paper airbag, **2-layer** with PE inner lining					
900 x 1200	400	0,2	0,6	350	2003057
900 x 1500	400	0,2	0,6	450	2003573
900 x 1800	400	0,2	0,6	300	2003574
900 x 2100	400	0,2	0,6	250	2004084
Kraft paper airbag, **4-layer** with PE inner lining					
900 x 1200	400	0,4	1,2	250	2003058
900 x 1500	400	0,4	1,2	200	2003575
900 x 1800	400	0,4	1,2	250	2003576
900 x 2100	400	0,4	1,2	150	2004085
Kraft paper airbag, **6-layer** with PE inner lining					
900 x 1200	400	0,6	1,8	250	2003059
900 x 1500	400	0,6	1,8	200	2003577
900 x 1800	400	0,6	1,8	200	2003578
900 x 2100	400	0,6	1,8	150	2004086

There are two variants of inflators available for the kraft paper airbags. Choose between the standard version 2 and the air gun with manometer 1 (pressure gauge).

Inflator for AirflexPaper airbags

Version	GIN-Number
Inflator with manometer [Fig. 1]	2003579
Inflator without manometer [Fig. 2]	2003063

i Further filling adaptors and airbags, including 6-layer airbags, can be found online at: **www.spanset.de**

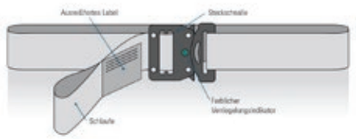
3.9 ACCESSOIRES

CTUXafe – Container door protection

- Protects against uncontrolled opening of a container door
- Quick and easy to fit
- Fits any container, even in tight spaces
- The strap has a breaking strength of 1.8 t and thus a maximum holding force in the strapping of 3.6 t

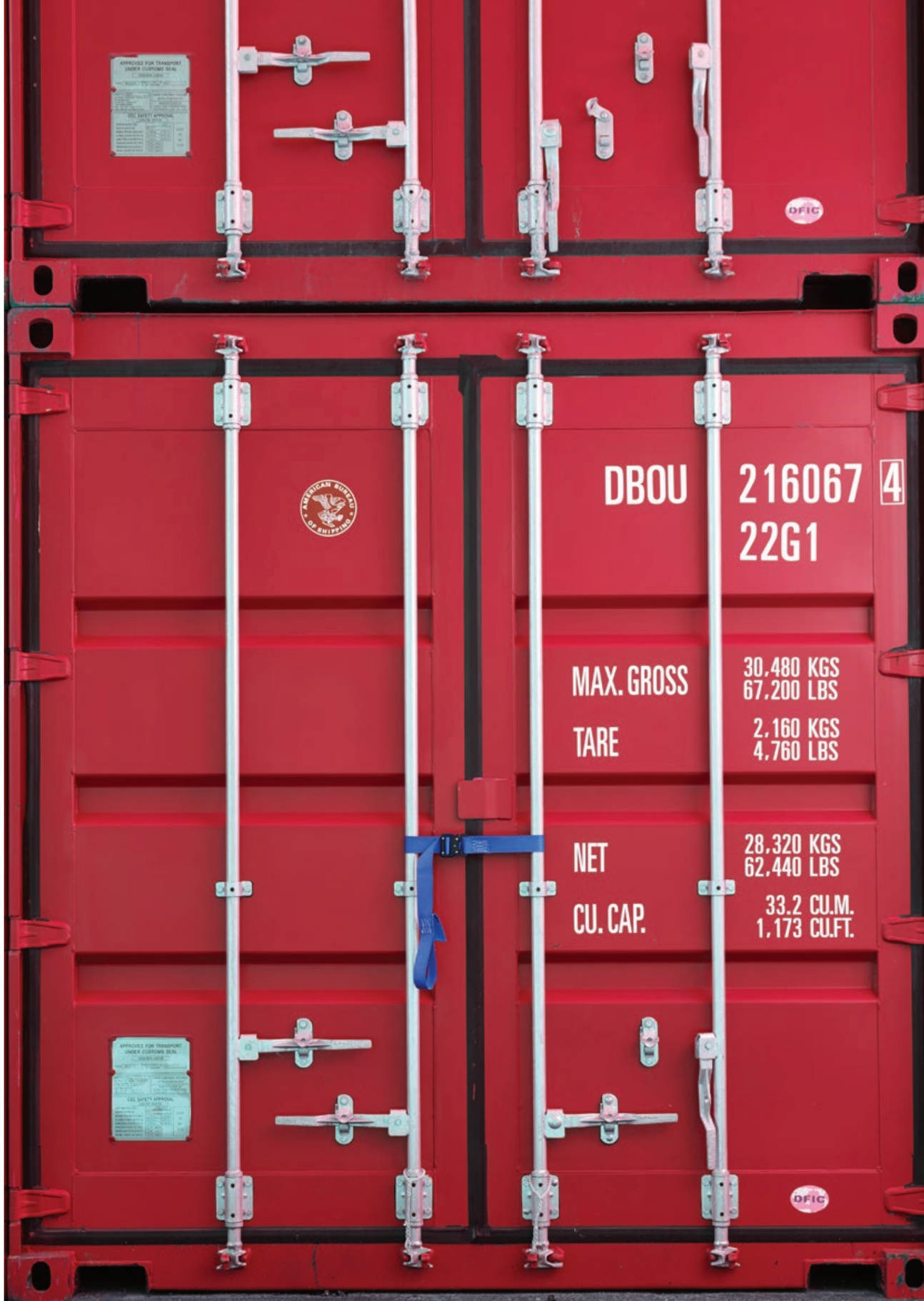
Before opening a door, the locking bars of both doors are connected to one another using a one-piece lashing strap with a clip buckle. If the door is under pressure from the inside after unlocking, the strap prevents the door from being opened wider than a small gap. The door is restrained by the CTUXafe safety strap. This allows the user to take appropriate securing action to open the doors safely. Afterwards, the strap is released and removed from the doors.

Advantage of CTUXafe:
It is easily and quickly attached. CTUXafe is cost-effective and – unlike the diagonal securing mechanism – can be attached without other aids.



SpanSet CTUXafe – prevents unpleasant surprises when unlocking the container door

Max. holding force at strapping [t]	Length	Packaging unit [pc]	GIN-Number
3,6	1.280 mm	1	2006050



3.10

Vehicle transport safety device

How vehicles with CarFix and TruckFix do not start rolling unintentionally

Securing vehicles on car transporters must not only be safe - due to the large number of vehicles to be transported, attaching the lashing system should also be uncomplicated and quick. TGC Autotransporte GmbH from Wegberg is specialised in the transport of new and used vehicles from small cars to commercial vehicles. Every day, the fleet is on the road in Germany, so the lashing equipment and perforated plates of the transporters are subjected to a lot of stress. To ensure that the expensive load reaches its destination undamaged, the company relies on the SpanSet lashing systems CarFix and TruckFix, which are equally convincing in terms of safety and economy. „The innovative Snake Hook, which can be rotated 360 degrees, not only protects the perforated plates of our vehicle transporters, but can also be hooked into them very easily. In addition, the variable strap controller of the lashing system delights our drivers, as it fits both small and large tyres. CarFix and TruckFix also already comply with the future regulations for car transport. Thus, the use of SpanSet lashing equipment also offers us a certain investment security," says Managing Director Aynur Ciftci.

SpanSet CarFix and TruckFix offer a wide range of possible combinations. Different hooks and ratchets, various controller versions or the optional Tension Force Indicator (TFI), a unique tool that reliably indicates the pretensioning force achieved, make the lashing system an optimal aid for securing vehicles.

SpanSet – Certified Safety

3.10 VEHICLE TRANSPORT SAFETY DEVICE

CarFix and TruckFix
Vehicle transport safety device

- complies with DIN EN 12195-2
- complies with VDI guideline 2700 sheet 8.2
- with integrated swivel hook or snake hook
- robust webbing with marking stripes
- two different controller versions
- on request also with individual imprint

The safest solution for vehicle transport

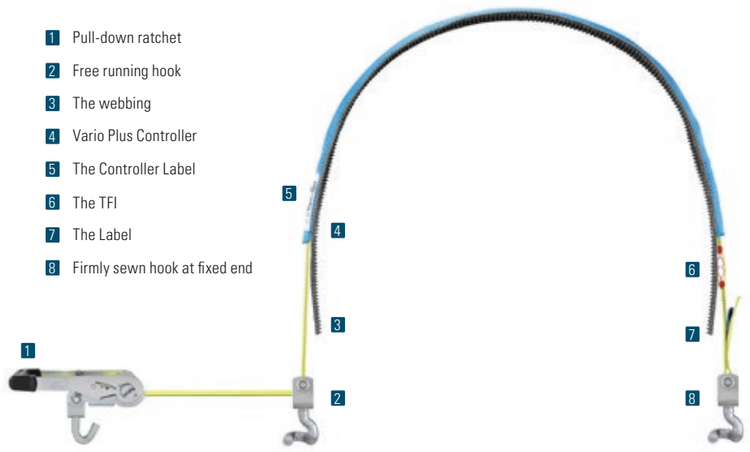
In dialogue with customers and on the basis of extensive test series, SpanSet has developed the new CarFix and TruckFix lashing systems, which more than fulfil the current requirements for securing vehicles on trailers in terms of safety, economy and handling.

The optimised force distribution in combination with the fastening elements protects the road plates. Powerful ratchets increase the pre-tensioning force and the innovative strap controller ensures extremely high force transmission. In addition to the guidelines of VDI 2700 sheet 8.1 and 8.2, the CarFix and TruckFix lashing systems also meet the high requirements of the Daimler guideline and the SpanSet factory standard.

In addition to the hook on the pressure ratchet, the lashing system is fixed to the perforated plate of the vehicle transporter at two other points. Different connecting elements are available for this purpose. In the standard version, CarFix and TruckFix are equipped with two swivel hooks. The VarioPlus version features two innovative snake hooks, which are perfectly adapted to the application and are more gentle on the perforated plate. This not only increases safety, but also contributes to economic efficiency.

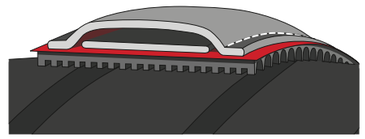
The strap controller is part of every lashing system. The profile on the underside of the controller adheres very well to the tyre during transport and is particularly stable in position, while the strap on the inside can glide perfectly during tensioning. The belt controller encloses at least 180 degrees of the tyre. Contact between the tyre and the webbing is thus avoided and both are equally optimally protected.

1. Pull-down ratchet
2. Free running hook
3. The webbing
4. Vario Plus Controller
5. The Controller Label
6. The TFI
7. The Label
8. Firmly sewn hook at fixed end

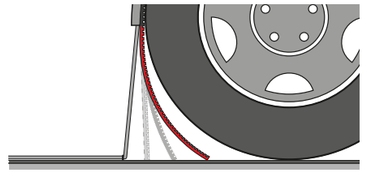


Vario-Plus-Controller

Controller with internal sliding surface
The Vario-Plus controller has an internal sliding surface sliding surface, which improves the Eta value. The friction values are reduced, the pre-tensioningforce is increased and the power transmission is improved.



Variable use
The Vario-Plus controller can be used with different types of vehicles. The strap is not completely contained in the sleeve, but freely lies freely on top. Turning down the support surface allows it to be used even with smaller tires.



3.10 VEHICLE TRANSPORT SAFETY DEVICE

CarFix – Car transport safety device

- complies with DIN EN 12195-2
- complies with VDI guideline 2700 sheet 8.2
- with integrated swivel hook or snake hook
- robust webbing with marking stripes
- two different controller versions
- on request also with individual imprint

Fig.: Carfix CT35 Vario Plus

WH - Swivel hook

SH - Snake hook

45H - 45 Hook

CarFix – the lashing system for car transport

With an LC of 1,500 daN, the lashing system provides ensures that cars are held absolutely securely during transport. The compact ratchet allows the lashing system to be attached even in tight spaces. The standard versions of the CarFix systems are equipped with two swivel hooks that can be rotated 360 degrees. The hooks are at the loose end and free-running into the vehicle transporter's deck plate, thus ensuring that the system is securely fixed.

CarFix VarioPlus has two innovative snake hooks, which are perfectly adapted to the application and are more gentle on the perforated sheet. In addition, the Vario-Plus controller has an internal sliding surface that improves the ETA value.

Optionally, CaFix is also available with TFI, which leads to significantly more safety when lashing cars on vehicle transporters. In contrast to the classic lashing systems, however, the TFI in the CarFix systems is not installed in the tensioning element but in the webbing.

Carfix CT35 Vario

Hook version	LC [daN]	STF [daN]	width [mm]	length [m]	Colour strap	Controller length [cm]	ETA value min.	TFI	GIN-Number
Ratchet: WH Free running: WH Loose end: WH	1.500	330	35	2,80	grey	Vario 130 cm foldable to 100 cm	0,5	optional	2025530

Carfix CT35 VarioPlus

Hook version	LC [daN]	STF [daN]	width [mm]	length [m]	Colour strap	Controller length [cm]	ETA value min.	TFI	GIN-Number
Ratchet: WH Free running: SH Loose end: SH	1.500	330	35	2,80	yellow	Vario Plus 130 cm foldable to 100 cm	0,7	optional	2025531

3.10 VEHICLE TRANSPORT SAFETY DEVICE

TruckFix – Truck transport safety device

- complies with DIN EN 12195-2
- complies with VDI guideline 2700 sheet 8.2
- with integrated swivel hook or snake hook
- robust webbing with marking stripes
- two different controller versions
- on request also with individual imprint

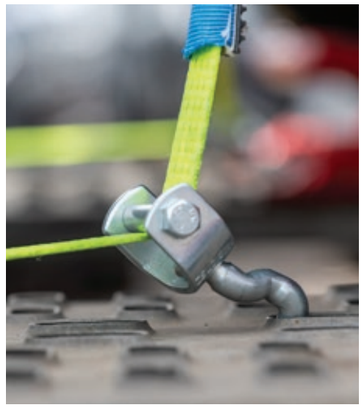


Fig.: Truckfix CT50 Vario Plus

A WH - Swivel hook

B SH - Snake hook

A 45H - 45 Hook

TruckFix – the lashing system for truck transport

The quality ratchet with integrated swivel hook is perfectly matched to the Truckfix lashing system. With an LC of 2,500 daN, the pressure ratchet provides an absolutely secure hold for extremely heavy vehicles. The long ratchet lever enables optimum power transmission when tensioning the lashing system. lashing system and thus offers the user an ergonomic advantage. The standard versions of the CarFix and TruckFix systems are equipped with two swivel hooks that can be rotated 360 degrees. The hooks are hooked into the vehicle transporter's deck plate at the loose end and free-running, thus ensuring that the system is securely fixed. The VarioPlus version has two innovative snake hooks, which are perfectly adapted to the application and are gentler on the perforated plate. In addition, the Vario-Plus controller has an internal sliding surface that improves the Eta value.

TruckFix CT50 Vario

Hook version	LC [daN]	STF [daN]	width [m]	length [cm]	Clolour strap	Controller length [cm]	ETA value min.	GIN-Number
Ratchet: WH Free running: WH Loose end: WH	2.500	500	50	4,50	grey	Vario 200 cm foldable to 170 cm	0,5	2025532

TruckFix CT50 VarioPlus

Hook version	LC [daN]	STF [daN]	width [m]	length [cm]	Clolour strap	Controller length [cm]	ETA value min.	GIN-Number
Ratchet: WH Free running: SH Loose end: SH	2.500	500	50	4,50	yellow	Vario Plus 200 cm foldable to 170 cm	0,6	2025533

3.10 VEHICLE TRANSPORT SAFETY DEVICE

SafetyPlus rescue slings

- Safety sleeve protects against uncontrolled recoil in the event of overloading
- Suitable for tensile loads of up to 50t
- Safety sleeve made from high-strength polyester

SafetyPlus – the rescue slings with safety sleeves

SafetyPlus is specially designed for pulling and rescuing loads. It is characterised by the fact that the part which absorbs the load is housed in a safety sleeve with suspension loops. In the event of overloading, this sleeve prevents the sling from recoiling uncontrollably and the associated risk of physical injury.

The significantly higher extension and compensation capacity of the safety sleeve, which is tailored to the loading capacity of the pulling sling, ensures that, if the pulling sling tears, the energy released will be absorbed in the safety sleeve and the device will not recoil uncontrollably. The actual pulling device is a roundsling that, like the safety sleeve and its suspension loops, is made of high-strength polyester.

SafetyPlus comes with a label that indicates to the user the maximum tensile force and the necessary safety instructions. The information regarding the tensile load is laid out in such a way that there is three fail-safe mechanisms in the system in the event of a break.

Name	Tensile load [kg]	Useful length [m]	Loop length [mm]	Approx. contact width of the loop Schlaufe [mm]	GIN-Number
SafetyPlus 4t	4.000	6	200	60	2024201
SafetyPlus 4t	4.000	8	200	60	2024202
SafetyPlus 8t	8.000	6	200	70	2024203
SafetyPlus 8t	8.000	8	200	70	2024204
SafetyPlus 12t	12.000	6	300	90	2024205
SafetyPlus 12t	12.000	8	300	90	2024206
SafetyPlus 16t	16.000	6	300	90	2024207
SafetyPlus 16t	16.000	8	300	90	2024208
SafetyPlus 20t	20.000	6	400	100	2024209
SafetyPlus 20t	20.000	8	400	100	2024210
SafetyPlus 30t	30.000	6	400	120	2024211
SafetyPlus 30t	30.000	8	400	120	2024212
SafetyPlus 40t	40.000	6	400	140	2024213
SafetyPlus 40t	40.000	8	400	140	2024214
SafetyPlus 50t	50.000	6	400	160	2024215
SafetyPlus 50t	50.000	8	400	160	2024216

i Technical data sheets at: **www.spanset.de**

3.11

Safety Management

Virtual Reality (VR) in the LaSi training: Every participant with their own test drive

Is the load securing really sufficient? - In the theory of truck drivers and shippers, the calculation usually works out. But how do pallets, crates and heavy individual items actually behave in the event of a sudden evasive manoeuvre or emergency braking? „Our classroom seminars on load securing are always practically oriented „,says SpanSet Managing Director Andreas Höltkemeier. „But unfortunately it has not been possible so far for each participant to load a 40-tonne truck." With a virtual reality application, this is now possible. Together with the software company Motion & Strategy, which specialises in training, and TÜV Süd, SpanSet has developed a programme for virtual truck loading. The participants simulate the procedure in the LaSi 1 seminars and carry out the load securing independently. To do this, they use SpanSet equipment such as anti-slip mats and tension belts. Then the test drive begins. - Everything virtual! „It is exciting to watch the professional drivers experience critical situations with the truck," says Höltkemeier. If everything goes well, the participants find objective confirmation of their competence in load securing. And if something goes wrong and the pallets - virtually - spread across the road? Then the accident leaves a lasting learning effect on the participant who released the truck for the test drive.

„Spanset recognised very early on that virtual reality is ideally suited for a state-of-the-art training tool. It adds value to the participants' content and achieves excellent learning results," says Christoph Vanwersch, Managing Director Motion & Strategy. „Practitioners in the transport industry can be sure that they are booking contemporary seminars at a high technical level." Because face-to-face events with VR glasses are not always possible, there is also a desktop version of the LaSi tool. It is used, among other things, in online training courses and, in future, also as a web-based variant in eLearnings for self-study.

A detailed presentation of the VR solution from SpanSet for LaSi training can be found on the homepage of the developer: www.motionandstrategy.de/produkt-lasi.

SpanSet – Certified Safety

Load control seminars

SpanSet seminars - knowledge that brings you forward with certainty.

Know-how for your safety
SpanSet has been a pioneer in safety since its foundation. Many well-known companies rely on SpanSet's expertise and experience - often for many decades. Knowledge can be refreshed, deepened and extended in SpanSet's further training seminars. Employees who have up-to-date specialist knowledge automatically improve safety in the company.

Practice-oriented contents
Learning at SpanSet means: learning from professionals. Each seminar is supervised by one or more lecturers. supervised. Our certified instructors have many years of experience in load securing, height safety or lifting technology. They understand how to cover all safety aspects in theory and practice in a pleasant learning atmosphere. Seminar participants benefit in particular from professional seminar materials and the ability of the instructors to convey even the most difficult with simple words.

Available for everyone
Modern premises, air-conditioning and the latest technology as well as attentive support and hospitality ensure a successful seminar. You will find an optimal learning environment in the modernly equipped Safety Training Centre (STZ) in Übach-Palenberg. Many case studies can be presented here indoors and on the outdoor premises. SpanSet also offers seminars at other locations in Germany. In-house training courses at the customers' companies are also possible on request.

Lifting technology, PSAgA and more
In addition to the training courses in load securing, we offer an extensive programme of seminars for lifting technology and height safety or even truck seminars. Just take a look at our current seminar or safety management catalogue.

SpanSet seminars offer seminar participants:

- directly applicable practical knowledge
- up-to-date know-how (regulations, laws, standards etc.)
- Experienced experts as speakers
- concrete application examples
- Practical exercises and demonstrations
- intensive advice and support
- individual contents on request
- detailed seminar documentation
- certificate of competence

Sicherheits-Trainings-Zentrum STZ

Load control seminars

Selected references

Many renowned companies trust in the expertise and experience of SpanSet - often for many decades.

Atlas Copco
Bayer Leverkusen
Berufsfeuerwehren
Bitburger Bier-GmbH
BMW
Bundeswehren
DaimlerChrysler
DEKRA
DEULA
Deutsche Airbus
Deutsche Bahn
Deutsche Lufthansa
Deutsche Steinkohle
Deutsche Telekom
Dillinger Hütte GTS
Dornier Flugzeugwerke
e-on
EXXON
Flughäfen
Goldbeck
Henkel
Hydro Aluminium
Merck
Miele & Cie. KG
NATO
OPEL
RWE Power
Salzgitter
Siemens
Tectrion
THW
Thyssen Maschinenbau
Thyssengas
ThyssenKrupp Stahl
TÜV
WDR

Seminar No. SEM00003

Specialist seminar on load control

Training as an „expert" on load control in road transport

Objective

You will learn the correct, professional way to handle synthetic lashing equipment and how to calculate lashing forces. As an Authorised Person – following sufficient experience in your company – you will be in a position to assess the safe condition of load control equipment. You will also be able to carry out tests in line with the current rules and regulations.

Seminar No. SEM00030

Practical seminar on load control in vans

Training as an „expert" in load control aids in vans

Objective

You will learn the correct way of handling synthetic load control equipement and will be able to calculate lashing forces in theory and implement these in practice. As a result of the appointment in your company, you will be authorised to assess the safe condition of lashing straps and load control equipment in accordance with the current standards and provisions. You will finish the seminar as an expert in load control technology in vans.

Seminar No. SEM00057

Specialist seminar on load control in heavy transport

Training as an „expert" for load control equipment on road vehicles / large-area and heavy transports

Objective

You will learn to secure the load control of oversized loads or loads with a high mass on heavy-duty transporters, taking into account the current legislation and guidelines. You will finish the seminar as an expert in load control.

Seminar No. SEM00030-EINW

Instruction in load securing for craftsmen and small businesses

Training as an „expert" for Load securing in road haulage

Objective

You will learn the proper and professional handling of textile lashing equipment and the calculation of lashing forces. As a competent person, you are - after sufficient experience in the company - able to assess the safe condition of load securing equipment. You can also carry out inspections according to current rules and regulations.

Load control seminars

Seminar No. SEM00028

Practical seminar on CTU load control

Training in load control within containers in line with the CTU packing guidelines.

Objective

Load control within containers is a special case. We will explain the technical and physical context to this. In addition, you will learn which statutory provisions are important and what options you have for load control in containers. Furthermore, we will present the most important types of load control.

Seminar No. SEM00004

Practical seminar on load control VDI 2700a

Training as an „expert" for load control equipment in goods transport by road, using lashing equipment made from sythetic fibres, chains and wire cables in accordance with VDI 2700a

Objective

You will learn the correct way of handling lashing equipment and will be able to calculate lashing forces in theory and practice. You will be in a position to assess the safe condition of load control equipment in line with the current standards and regulations, and will be able to carry out the annual tests. You will finish the seminar as an expert in load control technology.

Seminar No. SEM00056

Combi seminar Load securing VDI2700a + CTU

3-day training with certificate of competence for load securing technology

Objective

Load securing in containers is a special case. In the seminar, we explain the technical and physical connections. You will also learn which legal regulations are important and what options you have for securing loads in containers. We will also introduce you to the most important types of load securing. This seminar combines the contents of the practical seminars SEM00004 and SEM00028.

Seminar No. SEM00029

Practical seminar on load control of hazardous goods

Training as an „expert" for load control aids in the transport of hazardous goods, with evidence of training in line with VDI 2700a and attestation in accordance with Article 6 of the German Hazardous Goods Appointed Persons Ordinance [Gefahrgutbeauftragtenverordnung].

Objective

Alongside the basics from the two-day practical seminar on load control, we will familiarise you with special legal aspects concerning the transport of hazardous goods.

Why not book now?

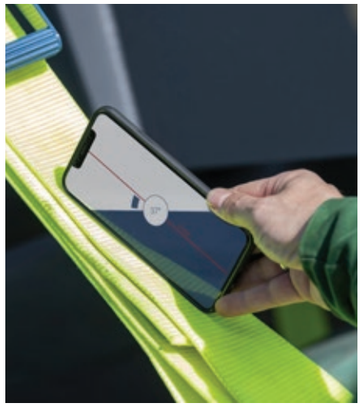
It is easy to book SpanSet seminars online at www.spanset-seminare.de or by telephone on **+49 (0) 2451 4831-230**.

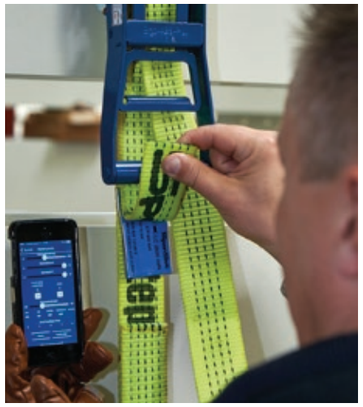
Online: All seminar dates!

All contents and dates of the different SpanSet seminars can be found on our website at: **www.spanset-seminare.de**

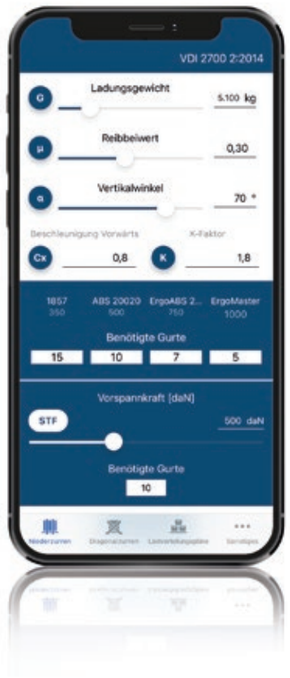
3.11 SAFETY MANAGEMENT

SpanSet lashing force app





- Calculation according to the guidelines of VDI 2700 ff and DIN EN 12195
- Useful tool based on the proven SpanSet lashing force controller
- for Android and iOS



Install now for free!

The free SpanSet lashing force app is available for download for Android and Apple devices in the Google Play Store and App Store.

Laden im App Store

Google play

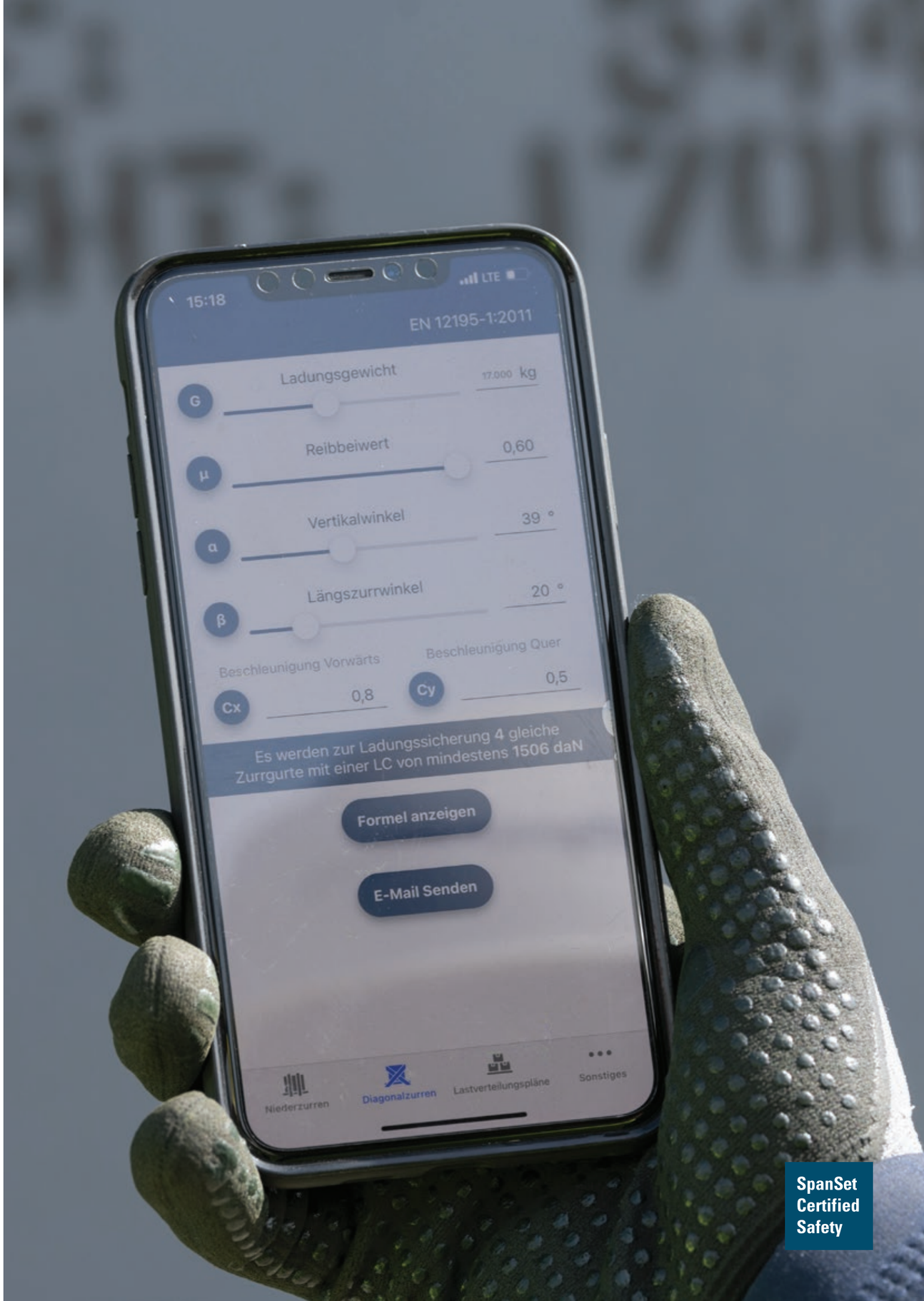
How calculations for lashing straps become child's play

The tried-and-tested SpanSet lashing force app, with over 100,000 users, relieves drivers of tricky calculation tasks, simplifies angle measurement and keeps an eye on current standards and guidelines.

The lashing force app offers a very clear and easy-to-understand user interface and makes calculating the required lashing straps child's play. Using a slider or direct input of the coefficients of sliding friction, angle of inclination and pretensioning forces, as well as the acceleration in the direction of travel and the K-factor, the application program directly displays the number of lashing straps required for a given pretensioning force (STF) in just a few steps. For the angle of inclination, the angle can even be calculated or precisely displayed by the position sensors in the smartphone.

The calculation of the load securing values is carried out optionally according to the guidelines of VDI 2700 ff and/or DIN EN 12195. The additional option of documenting the load distribution plan and storing photos makes the lashing force app a mobile added value in load securing.

- **Input of the**
  - Sliding friction coefficients,
  - inclination angle,
  - pretensioning forces
  - Acceleration in direction of travel
  - K-factor
- **Languages:**
  - German, English, Dutch, Italian, Portuguese, Spanish
  - Other languages are automatically smartphone settings, are automatically activated.
- **Berechnung:**
  - according to the old and the new version of DIN EN 12195 possible
  - according to the guidelines of VDI 2700 ff
- **other features:**
  - Easy to understand user interface
  - Documentation of the load distribution plan
  - Deposit of photos



Service

Individual solutions

Applications with special requirements need individual load securing tools. No problem! Together we come up with the right components to ensure that your load is transported safely. Individual strap lengths, different connecting elements. In special cases, our engineers find completely new solutions for your requirements in dialogue with the users.

Handling instructions

For the correct use of lashing equipment, handling instructions are increasingly required in which the correct application process is comprehensively described. Our operating instructions in various languages are included with every new product and are designed to minimise incorrect applications. If required, users can also access the instruction manual online on our website at any time.

Consulting & project support

The requirements for load securing are constantly increasing. As safety experts, we understand our role not only as a manufacturer and supplier of high-quality products. Our service starts at an early stage, for example when we advise your experts on the design of machines that will later be transported with SpanSet products. You benefit from the latest know-how and the results of our research and product development. Our experts develop safety concepts for you that are designed precisely to meet your needs and make your work much easier. Together with the international SpanSet Group and our partners and subsidiaries, we strengthen our customers' competences with the right solutions.

Testing, maintenance and repair

In SpanSet's in-house test laboratory in Übach-Palenberg, our load control equipment has to come up against the high demands of the SpanSet factory standard. Here, among other things, the standard tension force of lashing straps and the sliding friction values of anti-slip mats are determined and certified. Load control aids must also be checked for their safety condition at certain intervals in accordance with accident prevention regulations. Our service staff are at your disposal here. With the necessary qualifications, our team takes responsibility for compliance with the legal regulations.

NOTES

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INDEX OF KEY WORDS

SpanSet GmbH & Co. KG
Jülicher Straße 49-51
52531 Übach-Palenberg
Tel. +49 (0) 2451 4831-0
E-Mail info@spanset.de
Web www.spanset.de

www.spanset.de

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