



# Aktion

Height Safety  
Lifting  
Load Control  
Safety Management

# Wind

SpanSet  
GROUP

## SpanSet Group



- 1 Switzerland, 2 Germany, 3 England, 4 Spain,
- 5 France, 6 Italy, 7 The Netherlands, 8 Hungary, 9 Poland,
- 10 Australia, 11 Brazil, 12 USA, 13 Indonesia, 14 Taiwan,
- 15 China, 16 South Africa

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## Perfect solutions for the on-shore and off-shore

### **Long-term partner in the wind energy industry**

The demands in terms of lifting technology, load control and height safety are particularly high within the on-shore and off-shore industry. Erected structures and installations are subject to stringent monitoring. Dynamic forces generated by wind and waves can be immense, particularly in the off-shore sector, making working on the open sea very dangerous. As a globally operating specialist for lifting and load control, the SpanSet Group provides the industry with a partner with subsidiaries in all key industrial countries and an international network of dealerships.

### **SpanSet, Axzion and secutex**

Within the Group, SpanSet is the specialist for fabric lifting tackle, such as lifting straps and round slings with a load-bearing capacity up to 450 metric tonnes, innovative load control equipment and height safety equipment. SpanSet Axzion deals in developing and producing load handling equipment. Axzion is amongst the leading providers of grippers and beams within the off-shore industry, and that's not just because of the upending tool – the world's largest gripper. SpanSet secutex is dedicated to innovative coatings as the leading manufacturer of plastic parts to preserve and protect materials. Custom solutions can be produced quickly and cost-efficiently thanks to high-performance, in-house mould making. For instance, secutex buffer pads have been integrated into Axzion load control equipment.

### **Maximum quality – made in Germany**

As developers and producers the SpanSet Group provides everything from a single source and is always able to find the right solution for customers. SpanSet manufactures its products at four sites in Germany using cutting-edge production methods. Several load control and lifting technology developments have successfully revolutionised the market. Many decades of research and development have increased safety, made work easier, reduced the number of accidents and cut operating costs all over the world.

The drive to make these areas of key expertise even safer and more cost-efficient continuously creates new SpanSet developments. High-grade materials and in-house product development guarantee optimum functionality. In addition to our own testing laboratories and facilities, testing institutes including Dekra, TÜV, Lloyds Register and Germanischer Lloyd have repeatedly confirmed that the highest quality standards have been applied to our innovative products when they leave our factory gates.

These and other factors mean that SpanSet has been setting the trend in terms of lifting technology and load control for many decades, making the company the perfect partner for the on-shore and off-shore industry.

### **SpanSet – Certified Safety**

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## SpanSet Group Germany

### National expertise – excellently positioned

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#### SpanSet GmbH & Co. KG

At SpanSet customer safety is paramount when it's about protecting human life, lifting heavy loads or safely transporting a host of goods. Thanks to high-grade products, cutting-edge technologies and a comprehensive range of services, SpanSet offers customers professional and sophisticated lifting technology and cargo safety solutions as well as solutions to guarantee safety at heights. An ample range of seminars and workshops additionally help to protect human life and materials while simultaneously cutting operating costs.

- **Driver of load control innovations for over 50 years**
- **Heavy-duty slings for loads up to 450 metric tonnes**
- **Development of height safety products**
- **Sharing know-how as part of seminars, conferences and workshops**

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#### SpanSet Axzion

SpanSet Axzion is one of the world's leading manufacturers of load handling equipment. The wind energy industry – specifically the off-shore sector – has been particularly benefiting from custom solutions for many years. The need to develop individualised solutions represents the normal case in this industry: over 80% of all hoisting equipment is tailor-made, custom solutions for special tasks in hoisting, gripping or rotating. Developed and manufactured in Germany, the load handling equipment represents the maximum quality standards in terms of the materials used, associated processing, testing procedures and servicing.

- **„German Engineering“ und Technical Services**
- **Development of beams, hooks and grippers**
- **Specialised provider to the wind energy industry, primarily within the off-shore sector**

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#### SpanSet secutex

secutex was established in 1979 – a coating for hoisting straps and slings made from a particularly cut-and-wear-resistant polyurethane elastomer. The new coating was able to protect elements including lifting tackle against penetrating foreign matter. Today SpanSet secutex is the market leader in coated hoisting straps and protective tubes. The range of applications is constantly expanded on the basis of creativity and expertise. Impact and surface protection as well as acoustic insulation, for instance pulley coating, protective tubes, solid coatings, edge protectors, etc., and individual solutions are part of what the company does on a day-to-day basis.

- **Inventors of the „lifting strap coating“**
- **Ample product range from standard to custom solutions**
- **Application: impact and surface protection as well as acoustic insulation**



## Made in Germany Production facilities in Germany

We produce everything from thread to lifting straps, ratchets to lashing straps, steel to load control equipment. Therefore, we can provide custom products and solutions for the challenges encountered during the transport and installation of wind energy systems or other large-scale components.



### Übach-Palenberg

#### Lashing straps, round slings and more.

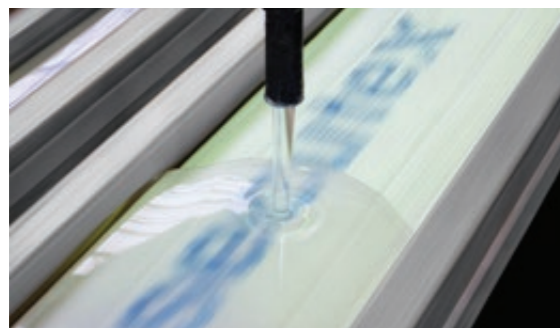
52 power looms produce around 750,000 metres of webbing and hose straps in Übach-Palenberg each month. A power loom for wide straps makes it possible to produce polyester fabric with a width of up to 600 mm in house, and Europe's largest sewing robot implements the CNC-controlled production of load safety nets. A fully automatic lashing strap robot produces small-scale series of lashing straps fully automatically. An in-house testing laboratory contributes to quality assurance as early as during the development phase.



### Langenfeld and Neustrelitz

#### Custom solutions for the on-shore and off-shore industry.

In Langenfeld and Neustrelitz SpanSet Axzion develops and produces around 1,200 hoisting equipment units per year for customers around the globe. At our in-house development and production facilities, we manufacture products under stringent monitoring, from steel to complete load handling equipment. The premises in Neustrelitz also include a testing tower that is the only one of its kind in the world: it enables the testing of load-handling and hoisting equipment up to 1,800 metric tonnes.



### Geilenkirchen

#### Unique coatings.

Within the corporate group, SpanSet secutex is the specialist for innovative coatings. Castor coating, protective tubes, solid coatings, edge protectors, etc., and also individual solutions are what the workforce in Geilenkirchen deals with on an everyday basis. At the company-owned premises around 70 staff members ensure that secutex products are available worldwide.



## Ideal technology for the wind energy industry, starting with development



### Certified according to global standards

Our products for the wind energy industry are produced and certified according to country-specific standards. We can optionally manufacture products for companies in countries subject to special demands and specifications according to the standards in that country.



### Close cooperation in development

In an effort to guarantee that our technology is always reliable and suitable for practical application, is handed over to users, we develop our products in close cooperation with renowned experts, testing institutes, higher education institutions and universities. Therefore, we can find the ideal solution for any application field.



### LEEA membership

SpanSet Axzion is a member of the „LEEA – Lifting Equipment Engineers Association“. This international specialist association sets benchmarks in safe hoisting technology and defines stringent demands for the ability and expertise of its members.

For more information visit:  
[www.leeaint.com](http://www.leeaint.com)



# Lifting Axzion

## LIFTING AXZION

### Grippers

#### Axzion Upending Tool



### The world's largest gripper

- Gripper range: 4.5 m - 6.5 m
- Load-bearing capacity: 1,500 metric tonnes
- Mechanically self-locking gripper
- Gripper with hydraulic drive
- WiFi panel, feedback from all sensors and interventions on board
- CNC control
- Hydraulic swivelling cylinder
- Dual drive and dual diesel generator
- Remote control with safety key system „Catch the Pile“ available
- 4 cameras with split-screen functionality to monitor operation
- Adapted gripper jaws
- 3-arm gripper, thus no deformation of the pile
- Hydraulically moving gripper jaw

#### Upending Tool – developed for monopiles weighing up to 1,500 metric tonnes

Wind energy systems' monopiles are getting larger and heavier as, in future, they will have to be installed in areas with deeper water. The Axzion Upending Tool, the world's largest gripper, has been developed for these extremely heavy monopiles. Thanks to cutting-edge control technology and variable functionality it is possible to safely grip and upend even the largest monopiles. The three huge grippers of the attachment tool each feature four toothed gripper jaws that have been adapted in diameter to firmly grip the monopiles, which, in turn, can individually weigh anything up to around 1,500 metric tonnes.

The huge monopiles' walls are thin in relation to their maximum diameter of up to 6 metres. It is necessary to carefully grip the steel tubes; simple hook designs may deform the pile. The Axzion Upending Tool features three arms and thus reliably prevents any pile deformation. The rotor star can be hydraulically pivoted to enable both horizontally and vertically positioned piles to be gripped and easily upended using a tilting mechanism.

Each of the arms features two, hydraulically powered gripper tongs. Grippers are also mechanically self-locking, meaning that in the event the drive fails, the unit guarantees components are securely held. The top pair of tongs can be moved hydraulically, which makes different gripping strategies adapted to the load possible and also means that the component is capable of gripping deformed tubes. The Axzion Upending Tool is freely variable to pile diameters of between 4.5 to 6.5 metres.

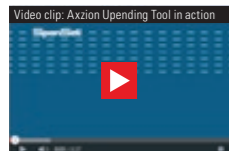
Cutting-edge control systems suitable for off-shore applications is a must. Individual movements are synchronised by a PLC control unit. Operation using the remote control is simple – incorrect operation is avoided thanks to intelligent locking systems. The gripper can optionally send all functions and sensor messages to a WiFi panel which also makes external control interventions possible (e.g. emergency or „Catch the Pile“ functions). Four high-performance cameras with powerful LED spotlights wirelessly transmit crisp images to the split-screen monitor so that crane drivers can identify the exact position of individual gripper tongs.

All drives have been installed with backups – safe and reliable functionality is a must. The Axzion Upending Tool features a dual hydraulic drive and two powerful, marine diesel generators. Should one unit fail, the second system will guarantee unrestricted operational readiness.

#### Options:

- Protective gripper jaws for the flange end
- Additional cameras
- Frame for storage on deck
- Off-shore service
- Hinge, all-round gripper (thus no deformation)

**Video clip:** Axzion Upending Tool in action





## LIFTING AXZION

Axzion Tower Tool Kit



## Complete solution to safely upend steel towers

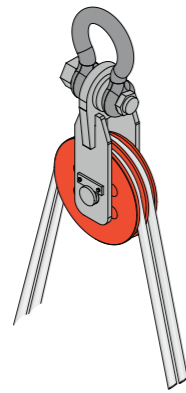
Tower Tool Kit system components:

- **Magnum-X heavy-duty slings**  
See page 40–41
- **Pulley with rotation pulleys**  
See page 16–17
- **Vario-TAP tower attachment point**  
See page 18–19
- **Vario-J-Hook, 60 t load-bearing capacity**  
See page 20–21

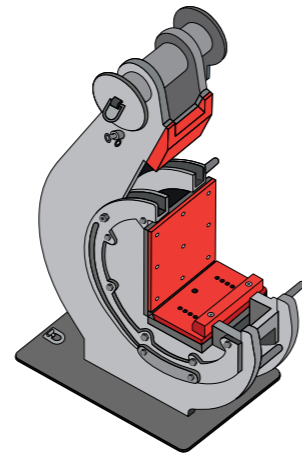
**Axzion Tower Tool Kit – all components required perfectly geared towards each other**  
Load-handling equipment for the wind energy industry must be easy to operate and particularly safe. Many successfully completed off-shore and on-shore projects are testament to the accuracy of the Axzion Tower Tool Kit.

All the individual parts required for the hoisting process and for upending steel towers are geared towards each other and adapted, tested and certified. All Tower Tool Kit components are developed and produced in house by the SpanSet Group. SpanSet Axzion also creates operating manuals and initiates the required calculations for the corresponding projects. This represents a genuine added value as customers are no longer forced to compile individual components from different manufacturers. They are provided with a tool kit featuring all of the individual parts that have been perfectly geared towards each other or may have even been produced for this particular purpose. SpanSet Axzion assists customers in all processes and assumes liability risks for the overall system supplied.

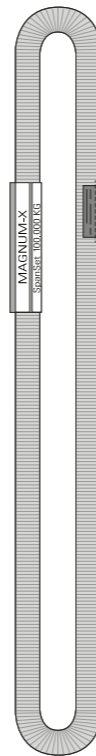
Pulley



Vario-J-Hook



Magnum-X



Vario-TAP



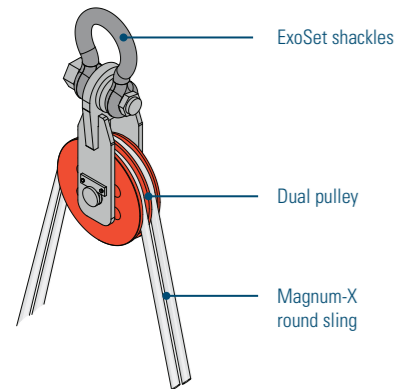
## LIFTING AXZION

AXZION pulley



### Rotation pulleys for lifting and rotating

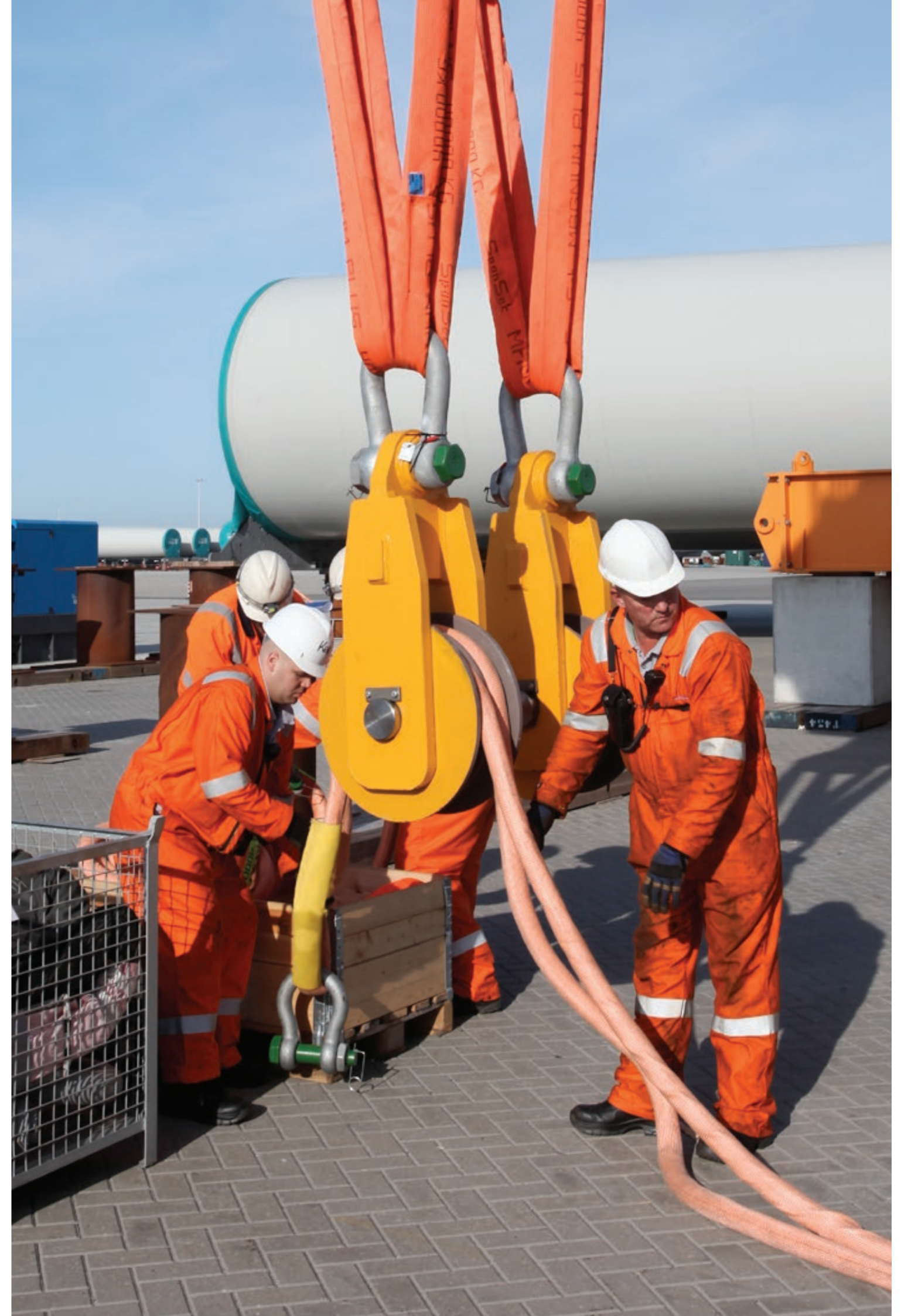
- Rotation pulleys feature durable Magnum round slings on the crane side
- Compatible with Magnum-X slings, 10 to 60 metric tonnes
- Dual pulley for sling deflection



#### Very easy to handle with Magnum-X heavy-duty slings

Axzion pulleys can be used to hoist and rotate complete steel tower segments. Attaching high-strength SpanSet Magnum-X heavy-duty slings to the load makes the pulleys particularly easy to use. The rotation pulleys have been developed with self-lubricating bearings that are maintenance-free. Lug reinforcements featuring steel cables make them suitable for permanent operation with shackles. On the crane side the rotation pulleys feature durable Magnum slings. When used in pairs, the nominal lifting capacity increases up to 200 metric tonnes. Axzion pulleys are available with transport and storage shelving on request and, if necessary, are also suitable for use with chains or wire mesh straps.

Item no.	Designation	Variant	Nominal lifting capacity [kg]
00222-01	PUL 4000 000 0	Pulley with steel cable and shackle	40.000
00578-01	PUL 4000 000 1	Pulley with Magnum-X round sling and shackle	40.000
00277-01	PUL 6000 000 1	Pulley with Magnum-X round sling and shackle	60.000
00277-02	PUL 8000 000 1	Pulley with Magnum-X round sling and shackle	80.000
00225-01	PUL 10000 000 1	Pulley with Magnum-X round sling and shackle	100.000



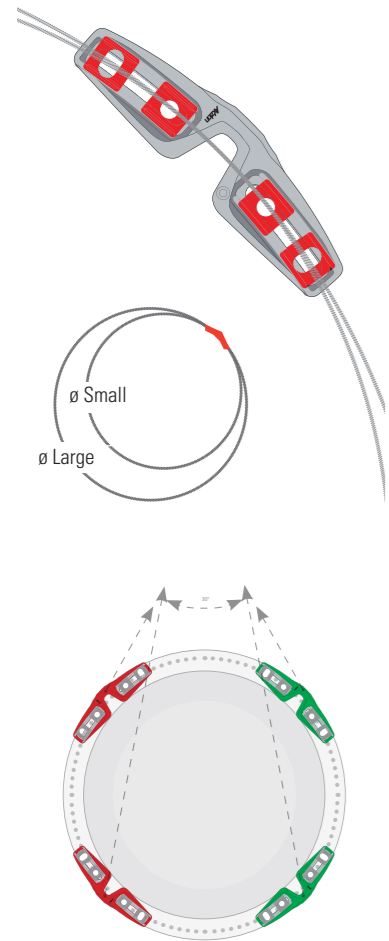
## LIFTING AXZION

### Attachment points

Vario-TAP



### Tower attachment points for any diameter



#### Vario-TAP attachment points for all system types

M56 or M20, diameters from 2 to 6 metres: wind energy system installation teams must hoist and rotate the various tower segments. Conventional tower attachment points are much too heavy and not flexible enough for on-site installation. In many cases, it takes several attachment points in different sizes for various tower sizes.

The new Vario-TAP fits all system types. The extra-wide slots in combination with sliding pressure plates featuring cross holes make it possible to recreate different pitch circle dimensions. It is no longer necessary to employ an auxiliary crane or fork-lift truck for assembly as the Vario-TAP itself weighs a mere 30 kg. Available in variants from 17 to 60 metric tonnes, the load-bearing capacity of the new Vario-TAPs is only restricted by the maximum capacity of the screws. The application side has been colour-coded and labelled to provide clarity: RED = LEFT and GREEN = RIGHT. The extra-strong, variable pressure plates are available for all screw dimensions from M20 to M56.

Item no.	Designation	Side	Colorr	Nominal lifting capacity [kg]	Weight [kg]
<b>On request</b>	Vario-TAP 17	right side	green	17.000	18
<b>On request</b>	Vario-TAP 17	left side	red	17.000	18
<b>00215-01</b>	Vario-TAP 27,5	right side	green	27.500	27
<b>00215-02</b>	Vario-TAP 27,5	eft side	red	27.500	27
<b>00216-03</b>	Vario-TAP 40	right side	green	40.000	35
<b>00216-04</b>	Vario-TAP 40	eft side	red	40.000	35
<b>00216-05</b>	Vario-TAP 60	right side	green	60.000	35
<b>00216-06</b>	Vario-TAP 60	eft side	red	60.000	35



## LIFTING AXZION

Vario-J-Hook  
Vario-J-Hook XL



### Safely, carefully and quickly lifting and rotate tower segments

- Patented inner shell on sliding bearings rotates with the tower flange during rotation
- Lifting posts for slings
- Rotary joint with adjustable counter-support for any tower flange
- Attachment points for tag lines

#### Careful rotation thanks to patented inner shell

Lifting and rotating tower segments is what the new J-shaped hook was developed for. During rotation, the durable locking tab engages behind the flange. The inner shell on sliding bearings (patent-protected) represents the core innovation which rotates together with the tower flange during rotation. Consequently, deflection forces are not transferred to the flange. All contact surfaces have been protected by durable secutex impact protection and the flange is protected and safe. The externally positioned pivot point makes it possible to use the J-Hook with tower flange thicknesses of between 60 and 220 mm and tower flange heights of between 200 and 600 mm.

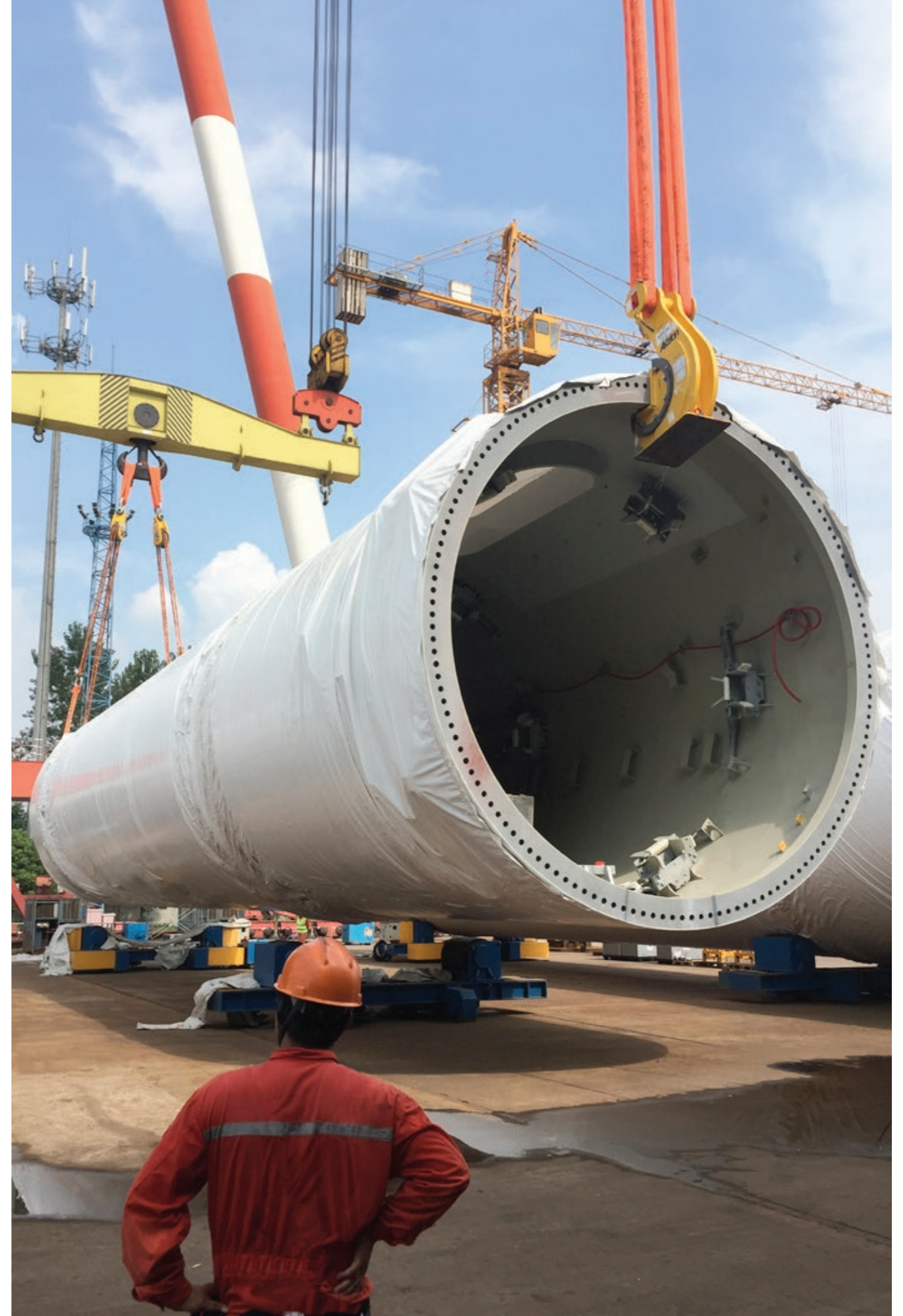
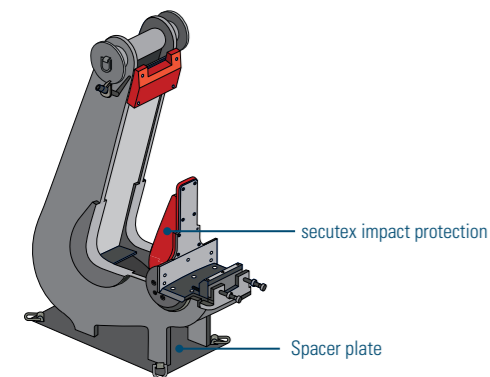
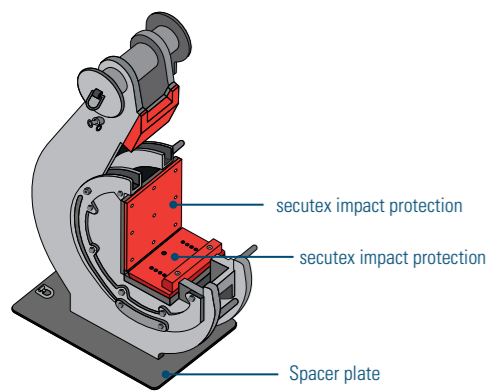
#### Huge time saver

After the hoisting and rotating process the J-Hook can simply be removed by a crane, there is no need for time-consuming installation work. In contrast, permanently fixed attachment points must be removed after the rotation, requiring users to work underneath the suspended load. Working underneath suspended loads is an absolute no-go, the load must therefore be supported on stands which significantly slows down the procedure.

#### Optional guy cable system

The guy cable system enables very soft towers to be hoisted and rotated without deformation.

Item no.	Designation	Nominal lifting capacity [kg]
00221-01	Vario-J-Hook	60.000
00477-02	Vario-J-Hook XL	60.000
On request	Vario-J-Hook XL	90.000
On request	Vario-J-Hook XL	120.000



## LIFTING AXZION

### Grippers

Axzion Tower Gripper



### Vertically transport towers ready for installation

- Gripper forces of 300, 450 and 650 tonnes
- Gripper jaws with secutex impact protection to prevent damage
- Large working platform with camera system
- Manual or remote-controlled operation
- PPE attachment points

#### Reducing off-shore construction time

Time is money – this is particularly true of the off-shore industry. The costs for installation vessels are spectacularly high and the weather can change at any moment. Installing pre-assembled towers can significantly reduce the time spent at sea constructing off-shore systems.

The Axzion Complete Tower Gripper is the perfect solution for this purpose. Thanks to the powerful gripper, pre-assembled towers can first be carefully and securely lifted onto a vessel before they are placed on the corresponding foundations in the wind park. The gripper jaws have been protected with secutex impact protection, meaning that quality flanges are not scratched or damaged when the towers are suspended.

The grippers are fully mechanically operated and do not require an external power supply. This makes the Axzion Complete Tower Gripper in variants boasting 300, 450 and 650 metric tonnes of hoisting force perfect for tough off-shore conditions. In problematic situations the gripper can be locked manually or by using the remote control.



## LIFTING AXZION

### Nacelle Spreader Beam



### Perfect centre of gravity with the nacelle spreader beam

- Attachment points for retaining cable systems
- With hydraulic cylinder or spindle drive
- Lifting posts for slings
- Can be controlled using a remote control

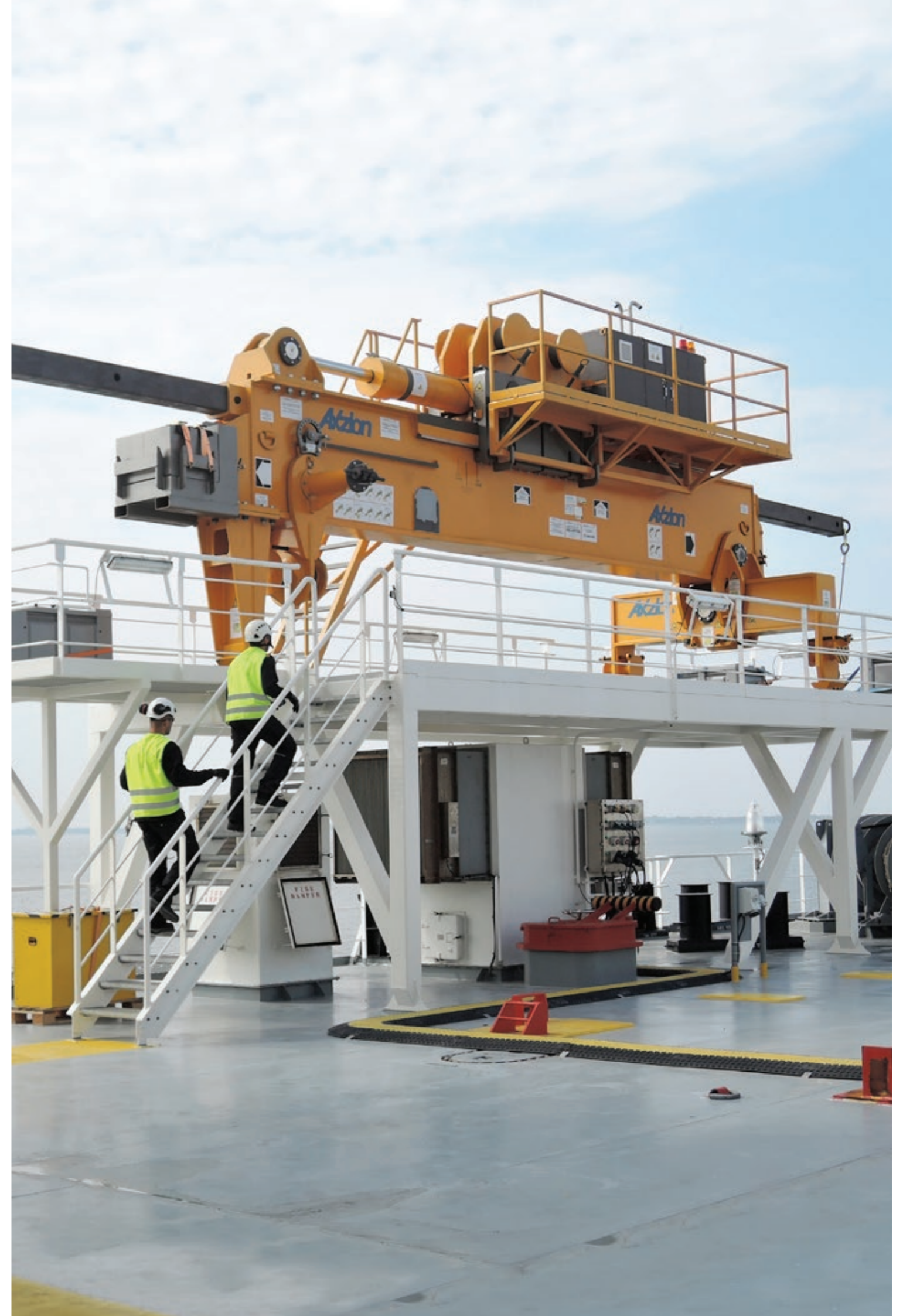
#### Controlled hoisting even when subject to strong forces

The nacelle is the largest and heaviest part of the wind turbine to be lifted. On or off shore, loads are huge and assembly cranes often reach their limits. It is almost impossible for cranes to control the large nacelles, and manual forces or retaining cables are no longer appropriate for the task at hand. As a result of the different configurations, the nacelle's centre of gravity may not always be directly below the crane hook, which can cause heavy loads to tilt.

Axzion Nacelle Spreader Beams feature an adjustable hook on the crane side which can be engaged on the load. Whether it is with hydraulic cylinder or spindle drive, and with or without an installed mains unit, Axzion Nacelle Spreader Beams are suitable for any application. The attachment points on the load can be adapted to the corresponding nacelle to correctly adjust the slings. This prevents potentially expensive damage.

#### Safely in control with remote control

When the spreader is being used off shore, we can measure potential frequency interference on deck and then adjust the supplied remote control accordingly. Key systems block safety-critical functions. These functions can only be used once the safely stored second key is available. It is possible to send functional messages by WiFi, so conducting an analysis via remote servicing is not a problem.



## LIFTING AXZION

### Rotor Tilting Beam



### Tilting beam for complete rotor stars

- Tilting beam with 90° range of movement when suspended
- Suitable for installation and removal
- Max. load-bearing capacity: 170,000 kg
- Can be operated using a remote control

#### Fast and safe installation and removal of the rotor star

Rotor stars no longer need to be installed in several stages. The rotor star, laying on the jack-up vessel, is initially picked up while horizontal. After having been slowly and carefully lifted, it is rotated to a vertical position. Once it has reached its target position, the vertically suspended rotor star is installed on the WEA nacelle at dizzying heights. Removal is also carried out slowly and carefully: the rotor star that has been installed vertically on the nacelle is attached to the beam and picked up before it is rotated back to a horizontal position. Last, but not least, it is once again repositioned on the jack-up vessel horizontally as a complete unit.

#### Careful rotation thanks to patented inner shell

Axzion Rotor Tilting Beams for the off-shore installation of wind energy systems have been designed for use on jack-up vessels. They are intended for the installation and removal of complete rotor stars – i.e. the rotor hub including three installed rotor blades – at sea. Thanks to the huge tilting beam the rotor can simply be rotated by 90° while suspended, even with pre-installed rotor blades. Heavy loads are no problem as it only takes an astonishing ten minutes to rotate the rotor weighing almost 150,000 kg. The rotation process is handled by the hydraulic cylinders that have been permanently installed in the tilting beam. Electrical and hydraulic units have also been permanently installed on the tilting beam, which is controlled and operated by remote control. Germanischer Lloyd is responsible for certification and approval; the load-bearing test was carried out at the Axzion test stand and was supervised by Germanischer Lloyd.



## LIFTING AXZION

### Rotor Lifting Device

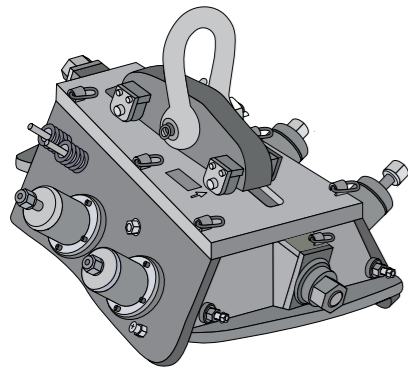


### Lifting and rotating the rotor with or without blades by 90°

- Max. load-bearing capacity: 90,000 kg
- With shackles and lug on the crane side
- Screws that have been connected to the attachment plates on the load side

#### Options:

- Attachment points for retaining cables
- Extra-wide rotor blade sling for auxiliary crane



#### Load-handling equipment to lift and rotate rotors

Rotor Lifting Devices (RLD) have been securely connected to the attachment plates with four screws. Thanks to pivoting lugs and shackles it is possible to rotate the rotor by 90° either on its own or with pre-installed blades. The main crane carries the load of the rotor, the auxiliary crane lifts from the bottom rotor blade and then releases it. Includes intuitive COG control.





## LIFTING AXZION

SBI rotor blade beam, 20 t



### Adjustable beam for confined spaces

- Simple assembly
- Driven purely electrically with a battery
- Very lightweight = 8 metric tonnes deadweight
- Certified as per ASME and CE
- Small amount of space required on the construction site
- Fast beam installation, ready for use within 2-3 hours

#### Options:

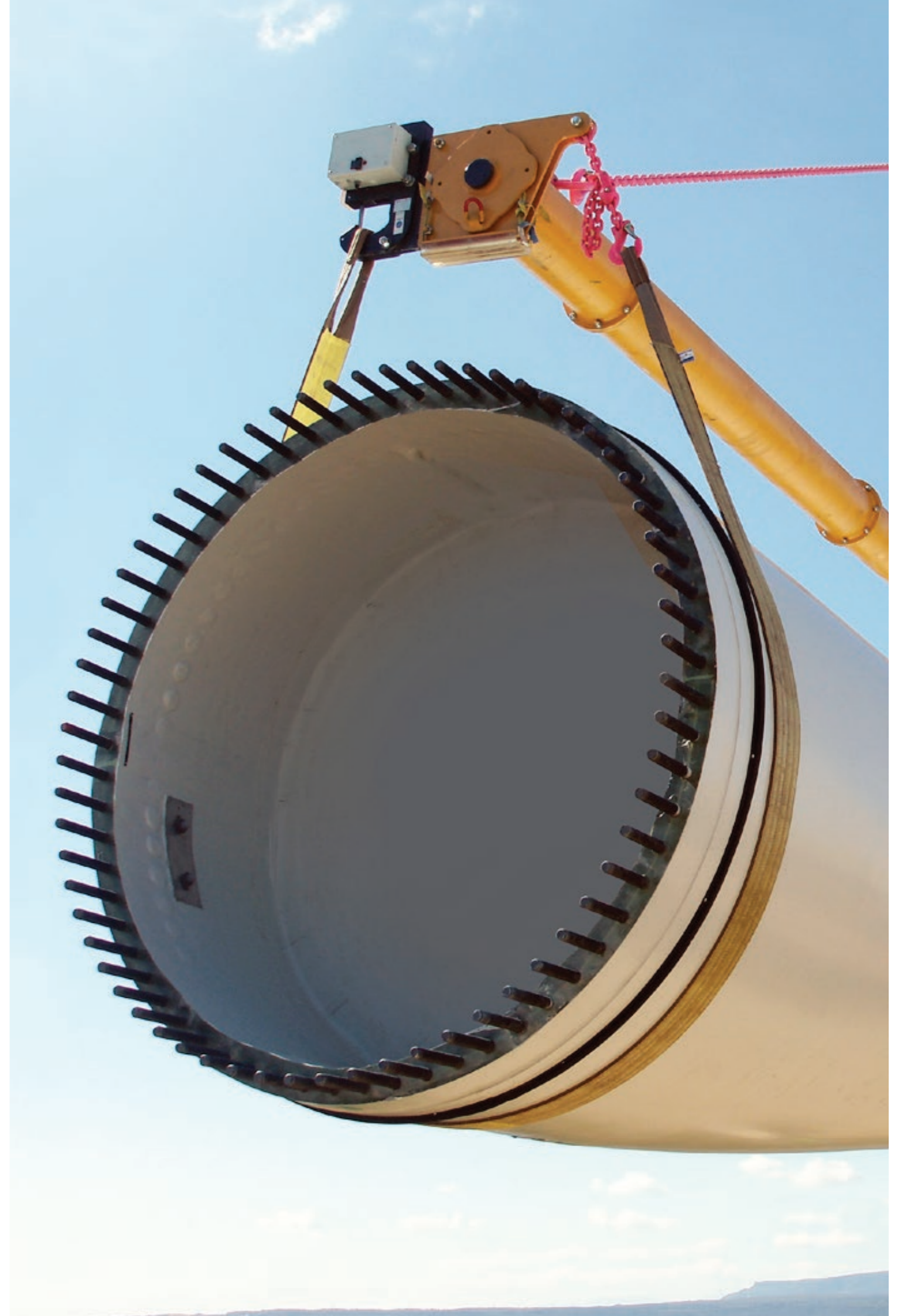
- Available for delivery with transport frame
- Camera system
- Chain shorteners for different rotor blades

#### Smooth assembly in high winds

Usually wind energy system rotors are assembled in a horizontal position before they are hoisted and attached as a complete unit. However, this method is possible only in situations with low wind force as gusts may overload the crane. For this reason, the assembly phase is frequently a waiting game.

SpanSet Axzion has teamed up with a wind energy system manufacturer to consequently develop Variobeam (20 metres long and only 8 metric tonnes in weight), a beam designed for individual horizontal rotor blade assembly work in high winds. The beam can also be used if the available space is insufficient to assemble the rotor horizontally. Variobeam can be disassembled and features plug-in connections with additional flange mountings. The individual beam elements are a maximum of 3 metres long. The pin is inserted into the matching counterpart before it is permanently secured using flange bolts. The remotely controlled, automatic hook represents a further benefit: simply drop the hoisting strap sling on to the root side at the push of a button.

Item no.	Designation	Nominal lifting capacity [kg]
01986-01	SBI beam	20.000



## LIFTING AXZION

SBI rotor blade beam lite, 25 t

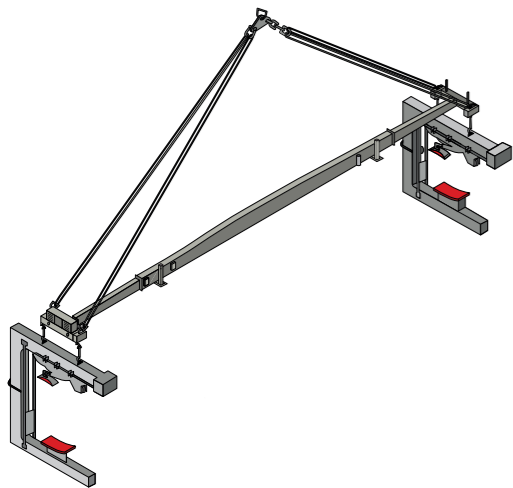


### Adaptable beam to reliably secure rotor blades

- Frame beam simultaneously acts as transport frame
- Very easy assembly (around 1–2 hours)
- Hydraulic rotor blade attachment
- CE and ASME certification
- Telescopic from 12 to 18 metres

#### Options:

- Equipped with a camera system
- Adjusted to load's centre of gravity



#### Telescopic SBI rotor blade beam for load-bearing capacities up to 25 metric tonnes

The SBI rotor blade beam lite, 25 t is quickly and easily assembled for the installation and removal of rotor blades and can be adapted to almost all of the various rotor blade dimensions. Hydraulic pressure plates grip the rotor blade's centre of gravity and guarantee that the blade is reliably secured. The durable beam is made in Germany, boasts a maximum load-bearing capacity of 25 metric tonnes and is operated using PLC control and a battery case. The clamps can be opened and closed by remote control.

The beam's C-frames are telescopic, making them very small and manageable, bringing about benefits in terms of transport. It requires just one 40-foot container which also makes it easy to transport by ship.

Item no.	Designation	Nominal lifting capacity [kg]
01986-06	SBI beam lite	25.000



## LIFTING AXZION

SBI rotor blade beam customized

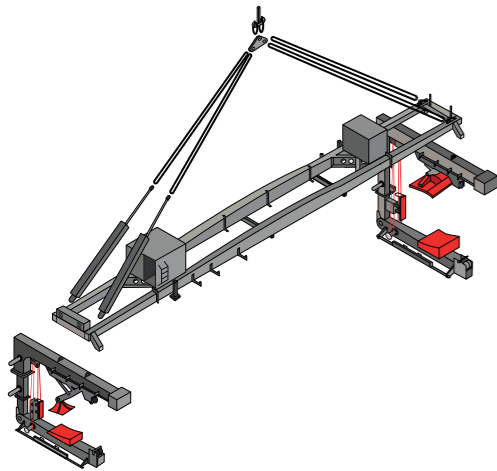


Customised: perfectly adapted to the application!

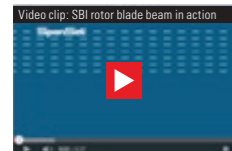
- Braces simultaneously act as a transport frame
- Very easy assembly (around 1-2 hours)
- Hydraulic rotor blade attachment
- CE, ASME and DEKRA certification
- Telescopic from 12 to 18 metres

### Options:

- Equipped with a camera system



Video clip: SBI rotor blade beam in action



### Rotor blade beam for almost any rotor blade

The individually adaptable SBI rotor blade beam „customised“ featuring telescopic C-frame grips around the blade’s centre of gravity is perfectly suitable for assembling and disassembling a host of rotor blades with almost any dimensions. Tilting of +/- 5° is possible thanks to the hydraulic cylinder. Installing blades individually rather than installing the complete star also requires significantly less space. The SBI beam boasts a maximum load-bearing capacity of 30 metric tonnes and is operated using a remotely controlled PLC control and a battery case. Thanks to two large LED spotlights it is also possible to work in conditions with poor visibility.

### Full service for smooth operations

Thanks to the variable length it is possible to transport the component to where it is needed by standard HGV, making it more cost-efficient. The open design guarantees good accessibility to all components which makes handling the beam significantly easier. The integrated emergency power supply rules out downtime during assembly. As is the case for all Axzion load-handling equipment, a worldwide support function with optional 24/7 service and potential remote servicing provides a full service. Any spare parts that may be required are also available at short notice.

Item no.	Designation	Nominal lifting capacity [kg]
00649-04	SBI beam customized	25.000 to 30.000



## LIFTING AXZION

Rotor blade rotation beam

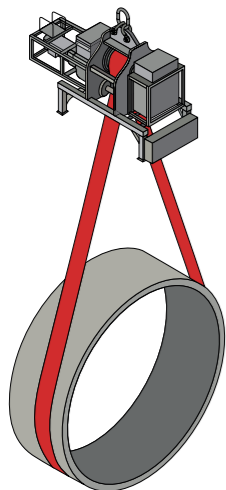


The flexible rotation beam is also suitable for heavy loads

- Featuring electric motors to adjust the Vario support and configure the system tilt
- Two continuously adjustable rotation pulleys, installed on travel gears featuring automatic cable compensation
- Individually driven rotation pulleys can be operated separately
- Complete with rotation straps featuring secuwave coating and C-clamp lock
- Electrically operated using buttons

### Options:

- Equipment for outdoor use
- Remote control
- With chains or wire mesh straps



### Safe rotation and a perfect centre of gravity for the load

Costly crane systems are frequently used for hours on end to carry out challenging rotations, thus forcing a large part of the production facilities into downtime during this time. SpanSet Axzion has developed Turnmaster rotation beams to safely and cost-efficiently rotate heavy and challenging loads. They are very easy to operate and in most cases the investment pays off within a short space of time. Thanks to matching hoisting straps, some of which feature a special coating, the torque is reliably transferred to the load to protect it. When equipped with secuwave hoisting straps, the coating's teeth engage with the toothed rotation pulleys of the rotation beam. The load can also hook onto the coating's recesses at the edges, thus making it now impossible for the load to slip through.

Item no.	Designation	Nominal lifting capacity [kg]
00838-01	Driven rotation unit	15.000
00390-01	Non-driven rotation unit	15.000
01874-01	Driven rotation unit	20.000
01875-01	Non-driven rotation unit	10.000



## LIFTING AXZION

Offshore TP beam



### Safely hoist up to 600 tonnes from the shore to vessels

- 600 tonnes lifting capacity
- Continuously adjustable attachment points to transition piece
- Design and certification as per DNVGL
- Around 23 t deadweight
- Including feet

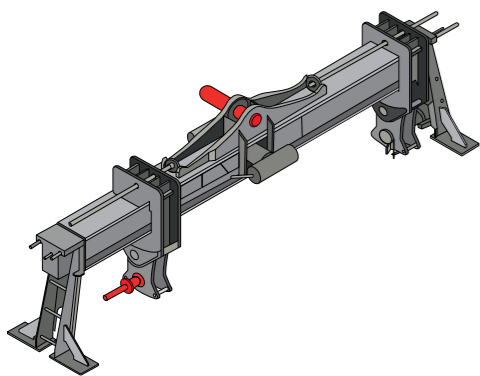
#### Off-shore TP beam to lift transition pieces

Transition piece monopiles are important components and the foundations of off-shore wind energy systems. The Axzion TP beam is used whenever monopiles must be safely transferred from the production site on shore to a vessel for transport to the installation site. Thanks to the installed joints the beam can absorb the up and down movements of the vessel during loading, which prevents damage and makes it easier to separate the beam from the transition piece, leading to lower costs and time savings.

The Axzion TP beam boasts a load-bearing capacity of up to 600 metric tonnes and is capable of handling monopiles with diameters of between 4.50 metres and 8 metres, making the beam flexible in terms of its application. The hydraulic cylinders are operated by manual or battery-powered pumps and are responsible for load handling.

DNVGL certification guarantees the suitability of the beam for the off-shore segment. Customisation is also available for the beam.

Item no.	Designation	Nominal lifting capacity [kg]
00609-01	TP beam	600.000





# Lifting SpanSet

## LIFTING SPANSET

### Heavy-duty round slings

Magnum-X



### Magnum-X – the new dimension in lifting

- 50% narrower than conventional polyester slings
- Standard RFID transponder to save product data, making testing easier
- High resistance leads to long service life and high levels of cost-efficiency
- Fits in even small crane hooks without being compressed

#### Benchmark in convenience, safety and long service life with a lifting capacity of up to 450 t

A structure consisting of high-performance polyester and the compact hose sheath makes Magnum-X up to 50% narrower than comparable heavy-duty slings. The sling is not compressed in small crane hooks and at attachment points and is simultaneously very rigid, both longitudinally and across the structure. A reduced formation of creases on the hose sheath in the crane hook and around the load significantly reduces wear.

A patch in signal colours with lifting capacity data woven into the fabric also guarantees clear identification from a distance and when the label is very dirty. The label is additionally protected by a foil and has been sewn in to protect it from tearing. It features an integrated RFID transponder to save product data which facilitates regular testing, among other things.

Magnum-X is available for delivery in a protective sheath with elastic sides for lifting capacities between 5 and 40 t and in a woven protective sheath for load-bearing capacities between 50 and 125 t. For lifting capacities between 300 and 450 t the woven protective sheath features side seams. Magnum-X slings with load-bearing capacities of between 200 and 450 t and custom variants are available on request.



Nominal carrying capacity [kg]	Magnum-X without side seam	Approx. material thickness under load [mm]	Approx. material width under load [mm]	L1 min. [m]	L1 max. [m]	Approx. weight per running m	Order number for standard lengths				
							4 m	5 m	6 m	7 m	8 m
5.000	✓	6	36	1,0	30	0,5	D079681	D079682	D078963	D079684	D079685
10.000	✓	11	67	2,0	30	0,9	D031023	D031029	D031030	D031031	D031032
20.000	✓	19	67	2,0	30	1,8	D030910	D030911	D030912	D030913	D030914
25.000	✓	19	85	2,0	30	2,4	D061947	D057505	D061948	D061949	D061950
30.000	✓	24	92	2,0	30	2,3	D030917	D030918	D030919	D030920	D030921
40.000	✓	25	101	3,0	30	3,5	D030924	D030925	D030926	D030927	D030928
50.000	✓	24	143	3,0	30	4,8	D031666	D031667	D031668	D031669	D031670
60.000	✓	26	142	3,0	30	5,8	D031673	D031674	D031675	D031676	D031677
80.000	✓	21	207	3,0	30	8,2	D031680	D031681	D031682	D031683	D031684
100.000	✓	20	291	3,0	30	11,8	D031687	D031688	D031689	D031690	D031691
125.000	✓	39	300	3,0	30	18,7	D031694	D031697	D031698	D031699	D031700
150.000	✓	51	280	5,0	30	20,0	D031703	D031704	D031705	D031706	D031707



## LIFTING SPANSET

### Heavy-duty round slings

MagnumForce



### New variability in lifting

- 60% lighter than conventional polyester slings
- 50% less contact thickness under load
- High resistance leads to long service life and high levels of cost-efficiency.
- Buoyancy makes MagnumForce ideal for off-shore application
- Fits in even small crane hooks without being compressed

#### Ideal heavy-duty sling for off-shore application

Comprehensively tried and tested design characteristics have been ideally coordinated and combined with innovative, high-performance materials for MagnumForce. The result: maximum safety and optimum handling for almost any application.

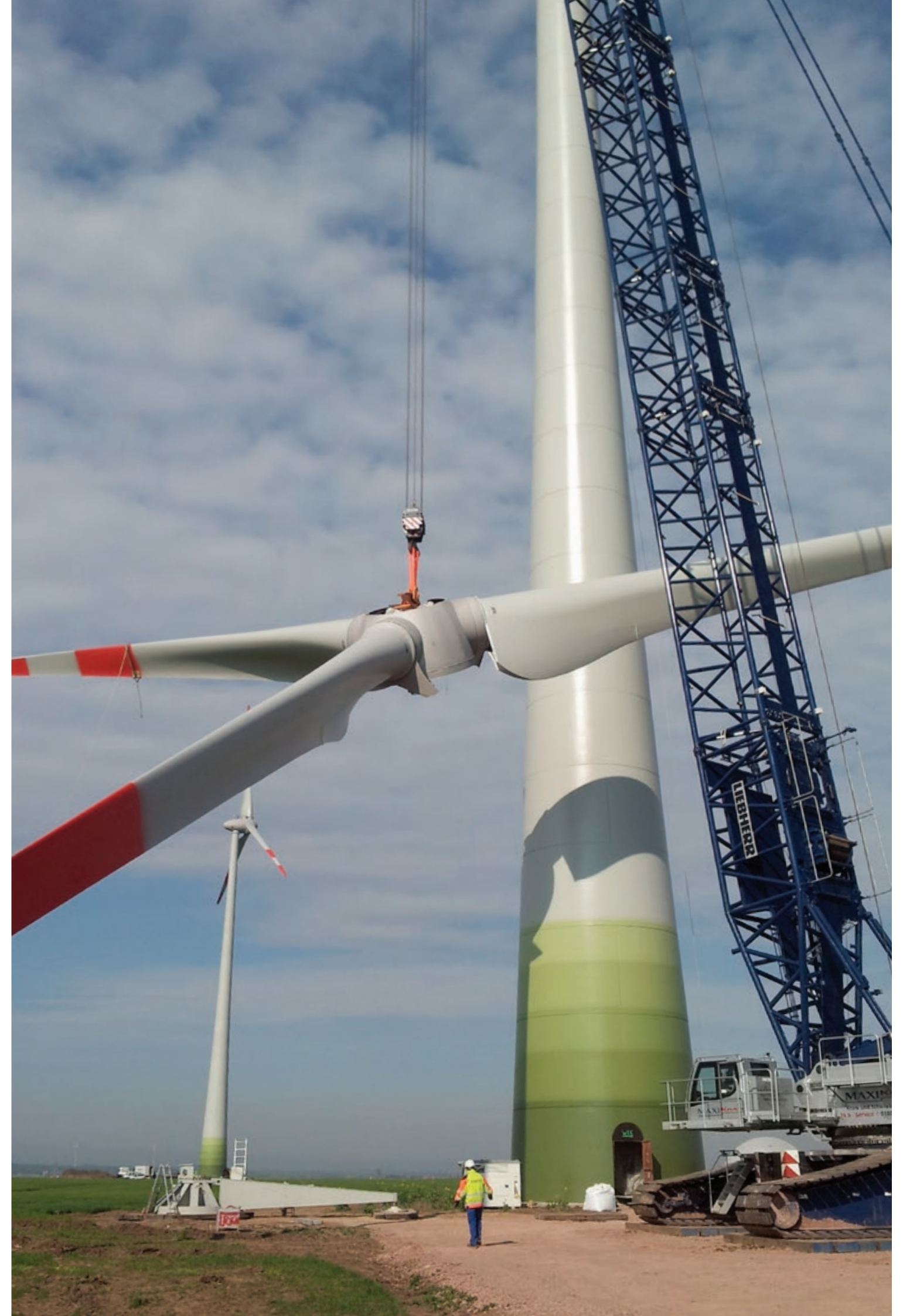
High resistance leads to long service life and high levels of cost-efficiency. Factors to guarantee this include the protective sheath: the ribbed design made of high-performance fibres reduces abrasion and improves resistance to cuts. UV-resistance and a low tendency to crease also reduce wear. Its buoyancy makes MagnumForce ideal for off-shore application. It is easy to recover should it drop into the water by accident.

The structure consists of highly molecular polyethylene and is significantly stronger than polyester. Less material is necessary for slings with the same load-bearing capacities, making MagnumForce compact and 60% lighter than conventional polyester slings. This simplifies handling and transport while saving time and money. With 50% less contact thickness under load it can be attached to smaller radii. This brings about benefits, such as time savings when fitting protective tubes, greater versatility and fewer application errors. Reduced stretch has the advantage of directly applying force during hoisting and leads to more accurate hoisting manoeuvres. The raised, woven carrying capacity data on the sling remains legible even when it is very dirty, thus ruling out any incorrect use. There is also no need for replacements or repairs.

The RFID transponder on the label makes it possible to digitally document testing – a very simple process with IDXpert Net, the associated SpanSet database software.



Nominal carrying capacity [kg]	Approx. material thickness under load [mm]	Approx. material width under load [mm]	L1 min. [m]	L1 max. [m]	Approx. weight per running m [kg]	Order number for standard lengths				
						4 m	5 m	6 m	7 m	8 m
10.000	7	70	2,0	30	0,8	2002539	2002540	2002541	2002542	2002543
20.000	18	91	2,0	30	1,6	2002544	2002545	2002546	2002547	2002548
30.000	20	115	2,0	30	2,6	2002549	2002550	2002551	2002552	2002553
40.000	22	140	3,0	30	3,4	2002554	2002555	2002556	2002557	2002558
50.000	23	152	3,0	30	4,2	2002559	2002560	2002561	2002562	2002563
60.000	23	165	3,0	30	5,0	2008377	2008378	2008379	2008380	2008381
80.000	27	200	3,0	30	6,1	2008382	2008383	2008384	2008385	2008386
100.000	35	190	3,0	30	7,1	2008387	2008388	2008389	2008390	2008391





## LIFTING SPANSET

### Heavy-duty round slings

MagnumPlus



### Strong grip for heavy loads

- Ideal adaptation of hose and structure reduce creasing
- Anti-tear label with RFID chip
- chip -durable variant
- Permanently legible, woven lifting capacity data
- Ideal protection from tearing thanks to reinforced fabric with fabric wire woven in

#### Lifting capacity of 300 metric tonnes when tensioned in a straight line

SpanSet MagnumPlus is made of high-performance fibres and offers all that a fabric sling needs for use with the heaviest loads: reliable grip, optimum handling and increased wear resistance. A single MagnumPlus heavy-duty sling is capable of lifting up to 300 metric tonnes when tensioned in a straight line, something only significantly heavier steel cable grommets would have been able to do in the past.

#### Safe under the heaviest loads

MagnumPlus has proven its worth in a host of situations and also under the heaviest loads. For instance, the sling's fabric hose is produced so that it fits tightly around the sides, thus minimising creasing even when carrying heavy loads. A woven-in fabric wire protects the hose fabric from tearing.



Nominal carrying capacity [kg]	Approx. material thickness under load [mm]	Approx. material width under load [mm]	L1 min. [m]	L1 max. [m]	Approx. weight per running m [kg]	Order number for standard lengths				
						4 m	5 m	6 m	7 m	8 m
10.000	12	103	1,0	30	2,2	D042017	D042018	D042019	D042020	D042021
15.000	16	115	1,0	30	2,7	D042022	D042024	D042025	D042026	D042027
20.000	18	159	1,3	30	4,0	D042028	D042029	D042030	D042031	D042032
25.000	25	155	1,3	30	5,0	D042033	D042034	D042035	D042036	D042037
30.000	19	170	1,3	30	6,5	D042038	D042039	D042040	D042041	D042042
40.000	22	198	3,0	30	9,7	D042043	D042044	D042045	D042046	D042047
50.000	24	210	3,0	30	12,5	D042048	D042049	D042050	D042051	D042052
60.000	27	220	3,0	30	16,6	D042054	D042055	D042059	D042061	D042062
80.000	47	260	3,0	30	20,8	D042063	D042064	D042065	D042066	D042067
100.000	49	300	3,0	30	24,3	D042068	D042069	D042070	D042071	D042072
150.000	50	430	5,0	30	45,5	-	-	-	-	On request
200.000 <sup>1)</sup>	55	420	8,0	30	45,5	-	-	-	-	On request
300.000 <sup>1)2)</sup>	50	440	8,0	30	45,5	-	-	-	-	On request

Custom variants on request. Produced as per DIN EN 1492-2. 1) With side seam; 2) Safety factor 1:5



## LIFTING SPANSET

### Protective sleeves

NoCut sleeve  
NoCut pad



### NoCut – fabric high-tech anti-cut protection

- High resistance to cuts and abrasion thanks to the use of high-performance fibres
- Identical cut resistance all round
- Very low deadweight
- Flexible and soft enough to bend
- Temperature range between -40°C and +60°C

#### Ideal protection from sharp edges

Sharp edges are amongst the main reasons for damage to lifting tackle and thus a frequent cause of accidents. Damage develops for example when the load is moved diagonally in relation to the lifting tackle. If the edge is sharp, the lifting tackle could in the worst case scenario be broken in two. Lifting tackle can be protected by an edge protector developed specifically for sharp edges, which is made of HMPE: NoCut®!

#### Cut protection made of high-performance fibres

The high levels of cut and abrasion resistance of HMPE (highly molecular polyethylene) has led to the development of NoCut®. A special testing system has been developed for this purpose that can determine the fabric's cut resistance. In this process, the protective effect of NoCut® is determined on edges with different degrees of sharpness. The corresponding value is certified by the DEKRA testing institute. NoCut® has been adapted to the different widths of SpanSet lifting tackle and performs outstandingly to protect components including PowerStar hoisting straps and Magnum-X slings as a result. NoCut® cut protection boasts a very low deadweight and a compact design for particularly ergonomic handling, which requires less strength and power.

#### NoCut® sleeve

NoCut® sleeve is a woven protective tube for hoisting straps and slings. The protective tube is merely slipped onto the lifting tackle before it is positioned on the sharp edge of the load to protect the lifting tackle. NoCut® sleeve has been designed with fabric ribs on both sides. On the outside the ribbed design increases cut resistance and, on the inside, it makes it easier for the lifting tackle to slide into the tube which makes it possible to position loads with sharp edges vertically. Even in confined spaces NoCut® sleeve can be easily positioned on the load. The tube design boasts the same degree of cut resistance all round and is suitable for use on both sides which boosts the service life and offers maximum operational safety as this rules out incorrect application. The label sewn into NoCut® sleeve also contributes to this thanks to its information on use and unique identification data. The protective tube is supplied in tailored dimensions and with trimmed ends.

#### NoCut® pad

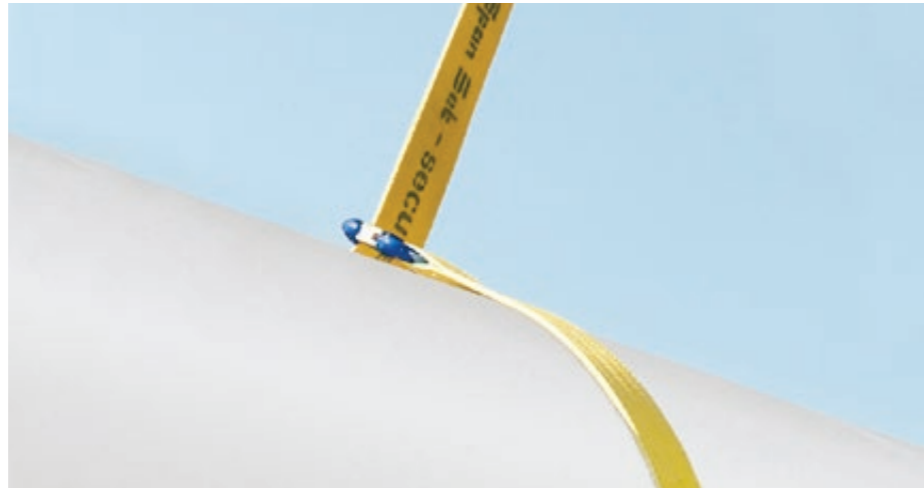
NoCut® pad is the combination of NoCut® sleeve with an internal fabric brace featuring attachment elements at both ends. NoCut® pad is installed where the lifting tackle comes into contact with sharp edges. For users this means they can rely on high levels of flexibility, fewer materials and a high degree of safety when handling loads with sharp edges! The size of the edge protector can be configured to exactly match the hazardous area and it can be accurately positioned over the sharp edges. NoCut® pad is available in a two and a four-ply variant. As a result of its multiple layers it achieves extremely high levels of cut protection and offers users many options even during critical hoisting manoeuvres. Pads can even cope with the smallest edge radii.



## LIFTING SPANSET

### SpanSet secutex lifting straps

secutex Powerflex P2



### Dual protection for lifting straps

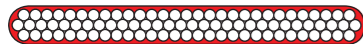
- both sides with secutex-Powerflex coating
- Sling reinforcement on both sides offers protection from abrasion
- Anti-tear characteristics, label protected by protective tube
- **Optionen:**
  - with RFID transponder
  - D-clamp on both sides

### Powerflex-P2 lifting straps for tough working conditions

The lifting straps are made of high-strength fabric featuring reinforced slings and complete secutex Powerflex coating, making them particularly resistant to wear and abrasion – and this significantly prolongs their service life. Powerflex is a thin spray coating that deeply penetrates the fabric as a result of the special production process and therefore protects it from foreign matter and fluid.

Variants with C or D-clamps are available for the choker. The C-clamp can be quickly hooked and unhooked. The safety latch prevents the hoisting strap from unintentionally slipping out and it can be replaced when damaged. The durable D-clamps also fit on almost any crane hook. Both clamps feature a guide recess in which the strap is firmly positioned to enable particularly smooth movement and keep wear to a minimum.

Powerflex coating



Nominal carrying capacity [kg]	Sling width [mm]	Slight length [mm]	L1 min. [m]	Strap width [mm]	Strap length [mm]	Approx. weight 1. M [kg]	Approx. weight lin 1. M [kg]	L1					
								2m	3m	4m	5m	6m	8m
1.000	30	300	1,0	30	9,1	0,4	0,3	S000002	S000003	S000004	S000005	S000006	S000007
2.000	35	300	1,0	60	9,5	1,0	0,6	S000008	S000009	S000010	S000011	S000012	S000013
3.000	50	400	1,3	90	9,9	1,3	0,8	S000013	S000014	S000015	S000016	S000017	S000018
4.000	65	400	1,3	120	10,9	1,8	1,1	S000019	S000020	S000021	S000022	S000023	S000024
5.000	80	500	1,5	150	10,9	2,4	1,4	S000025	S000026	S000027	S000028	S000029	S000030
6.000	70	700	1,9	180	11,1	3,0	1,7	S000031	S000032	S000033	S000034	S000035	S000036
8.000	90	800	2,2	240	11,1	4,3	2,3	-	S000037	S000038	S000039	S000040	S000041
10.000	160	1.000	2,6	300	11,5	7,2	2,8	-	S000042	S000043	S000044	S000045	S000046

Nominal carrying capacity [kg]	Sling width [mm]	Slight length [mm]	L1 min. [m]	Strap width [mm]	Strap length [mm]	Approx. weight 1. M [kg]	Approx. weight lin 1. M [kg]	L1					
								2m	3m	4m	5m	6m	8m
1.000	30	300	1,0	30	9,1	0,9	0,3	S000047	S000048	S000049	S000050	S000051	S000052
2.000	35	300	1,0	60	9,5	2,5	0,6	S000053	S000054	S000055	S000056	S000057	S000058
3.000	50	400	1,0	90	9,9	4,3	0,8	S000059	S000060	S000061	S000062	S000063	S000064
5.000	80	500	1,5	150	10,9	10,2	1,4	S000065	S000066	S000067	S000068	S000069	S000070



A large industrial load, possibly a wind turbine component, is being transported on a yellow trailer. The load is covered in a white tarp and secured with yellow ratchet straps. The trailer is parked on a paved area, and several workers in high-visibility safety gear are visible in the background. The scene is set in a foggy or overcast environment. The text "Load control" is overlaid on the right side of the image.

## Load control

## LOAD CONTROL

### Heavy-duty lashing

MaXafe 5.000 / 55



### Power pack for heavy weights!

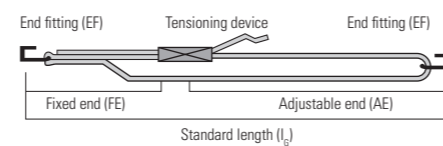
- Extremely low elongation of under 2%
- Lower deadweight
- Durable belt strap design
- Quality label with foil sleeve
- Accurate, automatically sewn seam
- PES/high-performance fibre belt strap

High-performance polyester is used for the belt straps of MaXafe heavy-duty ratchets to further improve the handling and cost-efficiency of transport involving heavy loads. Thanks to the high-quality, high-tech fibre the belt strap with a width of 55 mm matches the strength of a polyester strap with a width of 75 mm. The resulting reduction in weight amounting to around 24% when compared to conventional products with the same lashing force makes handling significantly easier for users. MaXafe is easy to handle and can be applied quickly. The extraordinarily low elongation of the belt strap (2%), similar to steel cables or chains, creates such high retention forces as a result of the early force introduction that heavy cargo will stay in place even in the event of emergency braking manoeuvres, or when drivers are forced to take evasive action.

#### MaXafe is available to users in two variants:

The single-part lashing strap is based on the Carlash system principle, features a triangle and D ring and boasts a permissible lashing force of 10,000 daN. The two-part variant, either with D ring (SFH) or ExoSet triangle hook (LS) on the loose end and the secured end, boasts a permissible lashing force of 5,000 daN.

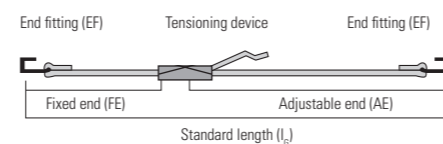
#### Carlash-System



Item no.	VE	Variant	LC* [daN]	l <sub>e</sub> [m]	trap width [mm]	Strap thickness [mm]	Strap elongation weight [%]	Approx. system [kg]
D076503	LS	Carlash	10.000	3	55	3	<2	10,3
D076504	LS	Carlash	10.000	4	55	3	<2	10,6

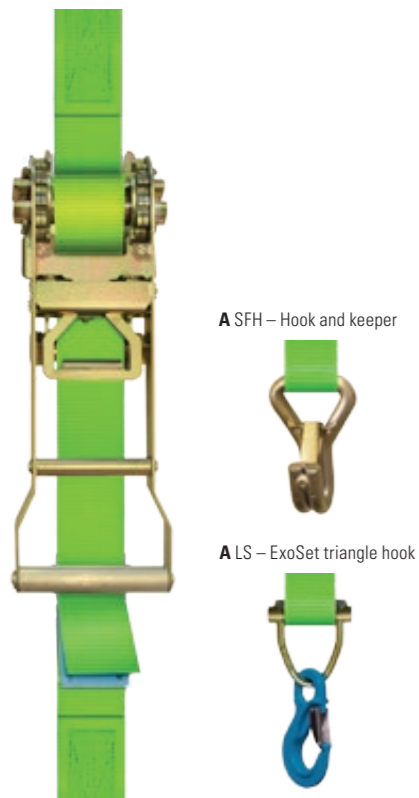
\* Lashing Capacity

#### two-piece



Item no.	VE	Variant	LC* [daN]	l <sub>e</sub> [m]	trap width [mm]	Strap thickness [mm]	Strap elongation weight [%]	Approx. system [kg]
D076498	2 x SFH	two part	5.000	3	55	3	<2	4,5
D076501	2 x LS	two part	5.000	3	55	3	<2	6,5
D076500	2 x SFH	two part	5.000	4	55	3	<2	4,7
D076502	2 x LS	two part	5.000	4	55	3	<2	6,7

\* Lashing Capacity



## LOAD CONTROL

### Heavy-duty lashing

ErgoMaster 2.000 / 50



### Maximum pre-tensioning forces with low force application

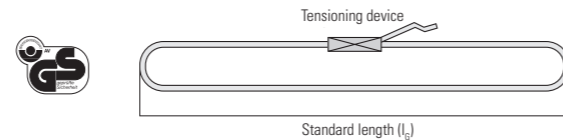
- Max. achievable and readable pre-tensioning force of 1,000 daN direct
- Ideal force transfer thanks to a unique slotted shaft system
- Ergonomic and improved force transfer
- Durable, anti-tear label, protected by foil sleeve and overlapping belt strap
- Controlled release of the pre-tensioning force by the Anti-Belt-Slip procedure prevents accidents

### Perfect solution for use with heavy loads

ErgoMaster makes it possible to establish the incredibly high pre-tensioning forces specified in the standard with a manual force of only 50 daN. If greater manual forces achieve even higher pre-tensioning forces in practical application, this can be verified and taken into account in the cargo safety calculation using TFI. For users this results in double the economic benefit as the required pre-tensioning force is achieved with fewer ratchets and this takes less working time.

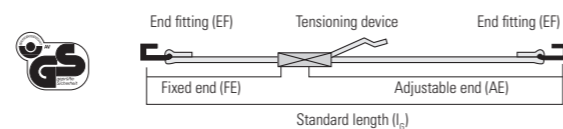
In contrast to conventional tensioning ratchets with long levers, which bring about disadvantages due to the large leverage, the ErgoMaster ratchet handle has been ergonomically and sensibly extended. The gear ratio of the belt coil has also been optimised and geared towards the slotted shaft. The special characteristics of this system are the patented, moving half-shafts that are smaller and are compressed when the belt strap is coiled. The system is equipped with a special tension force indicator (TFI) at the secured end as standard to verify the high pre-tensioning force. It can verify up to 1,000 daN STF.

### one-piece

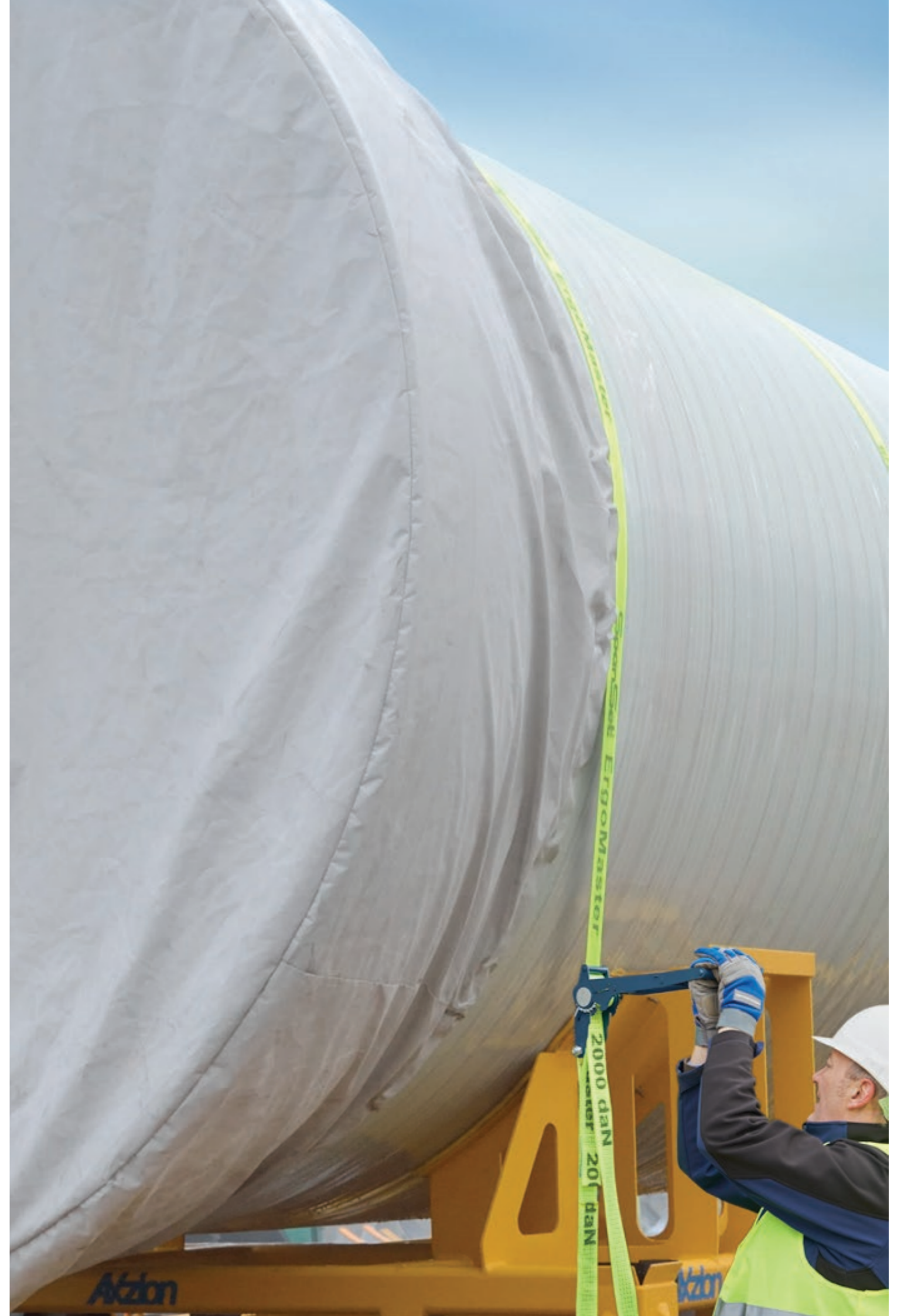
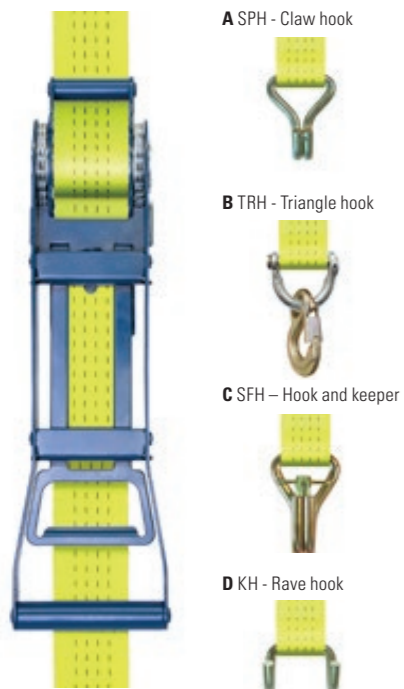


Item no.	Standard length $l_s$ [m]	Weight for $l_s$ [kg]	Surface finished coating	LC [daN]	Strap width $b$ [mm]
D055686	8,0	3,9	✓	4.000	50

### two-piece



Item no.	Standard length $l_s$ [m]	Weight for $l_s$ [kg]	End fittings (EF)	Surface finished coating	LC [daN]	STF [daN]	STF with 1,000er-TFI [daN]	Standard length FE [m]	Strap width $b$ [mm]
D055682	8,0	3,4	A	✓	2.000	720	1.000	0,5	50
D055685	8,0	4,1	B	✓	2.000	720	1.000	0,5	50
D055684	8,0	3,7	C	✓	2.000	720	1.000	0,5	50
D055681	8,0	3,3	D	✓	2.000	720	1.000	0,5	50



## LOAD CONTROL

### Heavy-duty lashing

ErgoABS 2.500 / 50



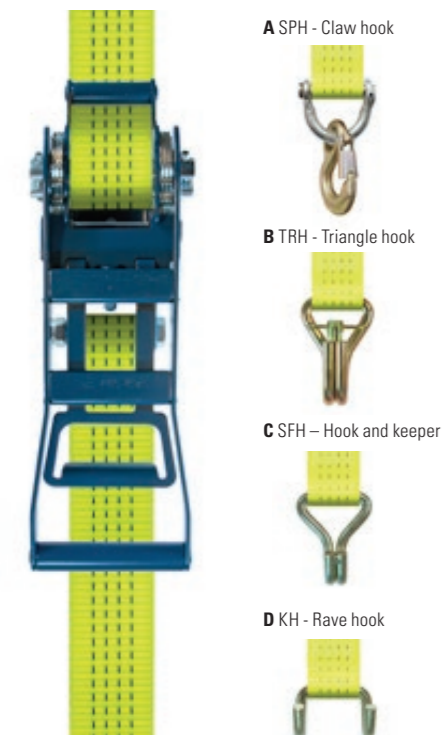
### Protects the back Secure heavy loads

- Tension force indicator (TFI) as standard, providing achievable, readable pre-tensioning force of 750 daN
- ABS ratchet can be gradually released, and is self-locking and equipped with double slider
- Tensioning principle and extended ratchet handle for ergonomic, improved force transfer
- Low levels of elongation, wear-resistant belt strap with corduroy edge and marker strips
- Durable, anti-tear label, protected by foil sleeve and overlapping belt strap

#### Ergonomic tensioning ratchet with Anti-Belt-Slip procedure

With the ErgoABS tensioning ratchet SpanSet provides HGV drivers with a solution that protects their back when lashing cargo while remaining quick and simple to use. The GS-certified ratchet with a long lever applies the ErgoABS principle of „pulling instead of pressing“. This feature and the extended ratchet lever as well as the double slider result in more force, easier handling and the protection of operators' backs. The belt strap features marker strips and a woven edge to reduce wear. The amount of strap retention required on the go is effectively reduced thanks to the low belt strap elongation of under 4%.

The ErgoABS tension ratchet has been coated with epoxy resin and is produced as per DIN EN 12195-2 with a belt strap width of 50 mm. The two-part variant boasts 2,500 daN, while the single-part variant boasts over 5,000 daN permissible lashing force and a pre-tensioning force of 350 daN. ErgoABS tension ratchets feature a TFI (tension force indicator) at the secured end and thus directly achieve a readable pre-tensioning force of 750 daN. The durable ratchet with a long lever is also equipped with the Anti-Belt-Slip procedure as standard, i.e. it can be released gradually and is self-locking.



A SPH - Claw hook



B TRH - Triangle hook



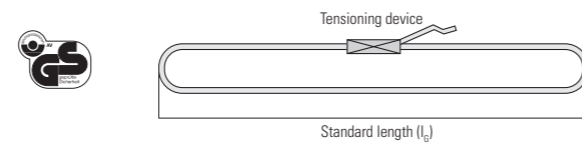
C SFH - Hook and keeper



D KH - Rave hook

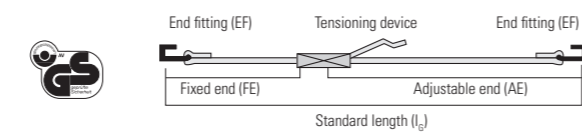


#### one-piece



Item no.	Standard length $l_s$ [m]	Weight for $l_s$ [kg]	Surface finished coating	LC [daN]	Strap width $b$ [mm]
D001563	8,0	3,2	✓	5.000	50

#### two-piece



Item no.	Standard length $l_s$ [m]	Weight for $l_s$ [kg]	End fittings (EF)	Surface finished coating	Tensioning device		STF with 750er-TFI [daN]	Standard length FE [m]	Strap width $b$ [mm]
					LC [daN]	STF [daN]			
D003541	8,0	4,3	A	✓	2.500	350	750	0,5	50
D003543	8,0	3,6	B	✓	2.500	350	750	0,5	50
D003544	8,0	3,9	C	✓	2.500	350	750	0,5	50
D003545	8,0	3,5	D	✓	2.500	350	750	0,5	50



## LOAD CONTROL

### Heavy-duty lashing

Spannfix ratchet lashing strap 2.500 / 50



### 100% safe on the road

- High pre-tensioning force with extended ratchet lever
- Label that is resistant to being pulled out, protected by webbing overlap
- The self-locking ratchet lever rules out subsequent springing open during transport
- Robust webbing with marking stripes

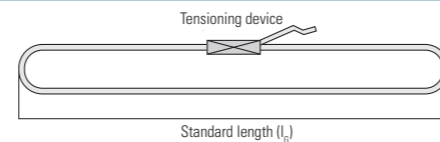
### Durable pressure ratchet with increased pre-tensioning force

The yellow, chromated Spannfix pressure ratchet features a self-locking ratchet lever which prevents it from disengaging while on the road. The extended ratchet lever also guarantees a higher pre-tensioning force.

Spannfix pressure ratchets are produced as per DIN EN 12195-2 with a belt strap width of 50 mm. The single-part variant boasts a permissible lashing force of over 5,000 daN while the two-part variant boasts a permissible lashing force of over 2,500 daN as well as a pre-tensioning force of 400 daN.

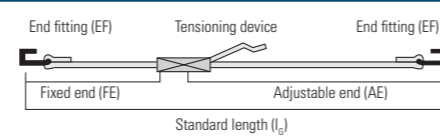
Spannfix ratchets can optionally also be equipped with the TFI 500 tension force indicator, meaning that it is possible to (easily and directly) verify a pre-tensioning force of 500 DaN.

#### one-piece

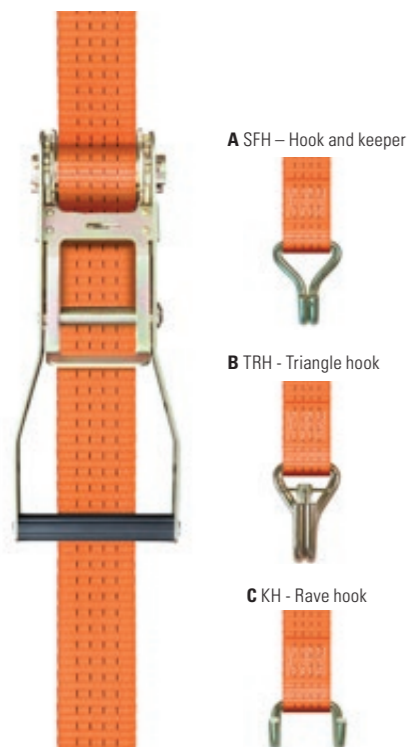


Item no.	Standard length $l_g$ [m]	Weight for $l_g$ [kg]	Surface finished coating	LC [daN]	Strap width $b$ [mm]
D059396	8,0	2,4	✓	5.000	50
D063746	10,0	2,6	✓	5.000	50

#### two-piece



Item no.	Standard length $l_g$ [m]	Weight for $l_g$ [kg]	End fittings (EF)	Surface finished coating	LC [daN]	$S_{TF}$ [daN]	Standard length FE [m]	optional with 500er-TFI [daN]	Strap width $b$ [mm]
length	8,0	2,9	A	✓	2.500	400	0,5	500	50
FE [m]	10,0	3,1	A	✓	2.500	400	0,5	500	50
D059110	8,0	3,1	B	✓	2.500	400	0,5	500	50
D065682	10,0	3,3	B	✓	2.500	400	0,5	500	50
D059366	8,0	2,7	C	✓	2.500	400	0,5	500	50
D056548	10,0	2,9	C	✓	2.500	400	0,5	500	50





## LOAD CONTROL

### Anti-slip mats

SpanSet Grip-S  
SpanSet Grip-G granulate mat



Cost-efficient  
and secure lashing



**An important factor when securing cargo with a forced connection is that the higher the friction between the cargo and the cargo area, the fewer lashing straps you will need. In most cases, anti-slip mats are what make cost-efficient lashing possible in the first place.**

#### SpanSet Grip-S

SpanSet Grip-S verifiably increases the friction value  $\mu$  for different friction combinations to 0.6 or more. Depending on the material combination, surface compression and weather conditions friction values of up to 1.2  $\mu$  are even made possible. These values have been tested and certified by TÜV Rheinland. It goes without saying that Grip-S fully complies with VDI 2700 sheets 14 and 15. The anti-slip mat is resistant to operating fluids and easy to clean. Even with a material thickness of only 2 mm, the durable anti-slip mat is resistant to everyday stress and can obviously be reused.

Item No.	Format [mm]	Thickness [mm]	Weight [kg]
SpanSet Grip-S – cut			
D000165	200 × 200	2,0	0,1
D000167	5.000 × 266	2,0	3,0
D000173	20.000 × 150	2,0	6,7
D000166	200 × 200	9,0	0,4
D000168	5.000 × 266	9,0	13,7

#### SpanSet Grip-G granulate mat

The popular anti-slip mat made of rubber granulate is of consistently high quality, meets VDI 2700 ff. and is suitable for universal use. Friction values of 0.6  $\mu$  or more are achieved with common material combinations which are then verified by test certificates. In production, rubber granulates of a defined quality and size are bonded under pressure and processed to form anti-slip mats. We can provide customer-specific anti-slip mats in different sizes and thicknesses in addition to standard cuts.

Item No.	Format [mm]	Thickness [mm]	Weight [kg]
Granulate mat – cut			
D000162	200 × 200	8,0	0,3
D000163	5.000 × 250	8,0	8,2
D002119	20.000 × 150	3,0	7,7



## LOAD CONTROL

### SpanSet secutex

secugrip anti-slip laminates  
secugrip spray coating



### Anti-slip laminates and spray coating

#### secuGrip – self-adhesive anti-slip laminates

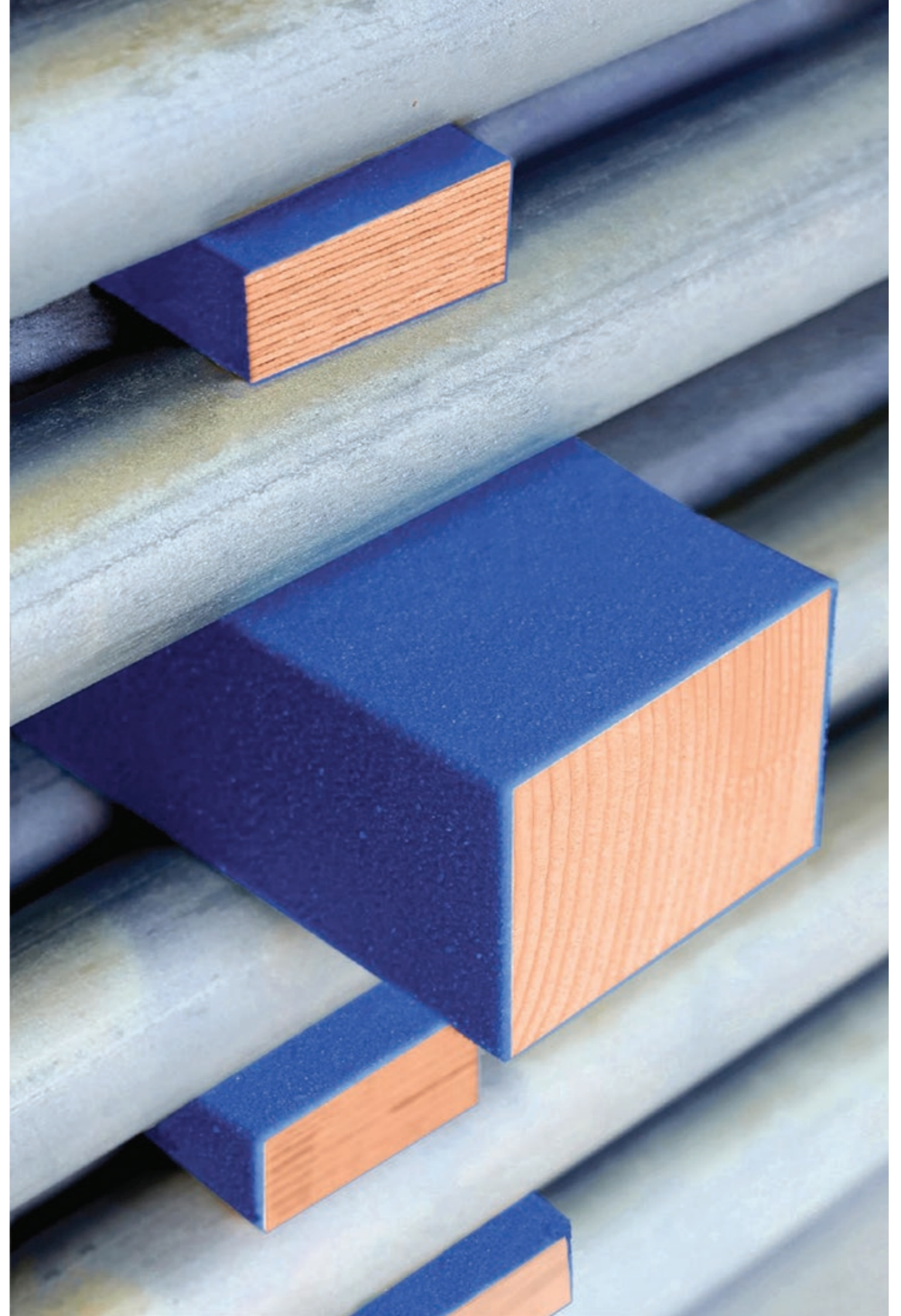
secugrip are self-adhesive anti-slip laminates that you can process yourself. The secugrip coating with a thickness of up to 2 mm boasts a high friction coefficient and is extremely resistant to abrasion. Installation is just as quick as it is easy: the back has been coated with acrylate adhesive and adheres to many smooth surfaces, such as metals, glass, ceramics, cardboard, various plastic materials and soft plastics.

Designation	Format [mm]	Thickness [mm]
secugrip 75	200 × 2.500	2,0
secugrip 75	1.250 × 2.500	2,0

#### secugrip 90 – spray coating

Load carriers, beams and pallets can be given permanent anti-slip characteristics thanks to the new secugrip 90 spray coating. The coating is applied with a thickness of approximately 2 mm. If required, the coating thickness can be increased by re-applying the spray coating. With common material combinations, secugrip 90 achieves a friction value of 0.6  $\mu$ , and is durable and long-lasting. Please provide the size, condition and material of your load carriers for a specific offer.

Designation	Format [mm]	Thickness [mm]
secugrip 90	200 × 2.500	2,0
secugrip 90	1.250 × 2.500	2,0





**Height safety**

## HEIGHT SAFETY

### Harnesses

SpanSet Clima Tech harness



The perfect combination of sit harness and fall arrester harness

Clima Tech combines the sit harness and the fall arrester harness. Thanks to its padded leg loops and the central fall arrester point it is particularly suitable for working with ropes. The ergonomically shaped, padded lap belt with lateral holding points has been designed for use with work positioning ropes when climbing. Tools and additional equipment can be attached to additional loops and buckles. Thanks to fall arrester points on the chest and at the back, Clima Tech can be used both as a fall arrester harness and as a work positioning harness.

Item No.	Colour	Size	Standards
D051584	Black	Standard	EN 361 + EN 358 + EN 813
D080948	Black	Large	EN 361 + EN 358 + EN 813



## HEIGHT SAFETY

### Lanyards

SpanSet DSL2  
SpanSet DSL2 Y



### Hybrid of two devices

- Functions like a fall protection device, used like a connecting element
- Dynamic fall test as per EN 360 and EN 355
- Shortens the required drop distance or fall distance by up to 50%
- No restriction in terms of use, unlike most other fall protection devices
- Need not be opened
- Compliance with dynamic limit values as per EN 355 for up to 140 kg
- Service life: 10 years from production date

Used like a fall damper cable with functionality like a fall protection device, this connecting element is the ideal product for working on scaffolding. The DSL2 fall damper was specifically developed for working at heights. The fall damper features a strap that can be integrated to decelerate a free fall. DSL2 is available in two variants: as an individual strap to protect workers using a fixed attachment point or a mobile attachment device, or as a dual version to protect workers when climbing or moving between attachment points. DSL2 is attached using the enclosed DIN-EN-362-compliant D rings at the rear attachment point of the fall deceleration system, while the loops and the D rings of the shock absorber unit are attached to the full-body harness.

Item-No.	Designation	Length [m]	Carabiner user side	Carabiner attachment side
D068726	DSL2-Lanyard	2	Aluminium-Supersafe-Karabiner	Aluminium alloy carabiner
D069388	DSL2-Lanyard	2	Aluminium-Supersafe-Karabiner	Steel scaffolding hook

Item-No.	Designation	Length [m]	Carabiner user side	Carabiner attachment side
D069381	DSL2-Y-Lanyard	2	Aluminium Supersafe Karabiner	2 x pipe hook carabiner steel
D069387	DSL2-Y-Lanyard	2	Aluminium Supersafe Karabiner	2 x Aluminium carabiner Twistlock

#### DSL2-Lanyard



#### DSL2-Y-Lanyard



Fall damper for up to 140 kg

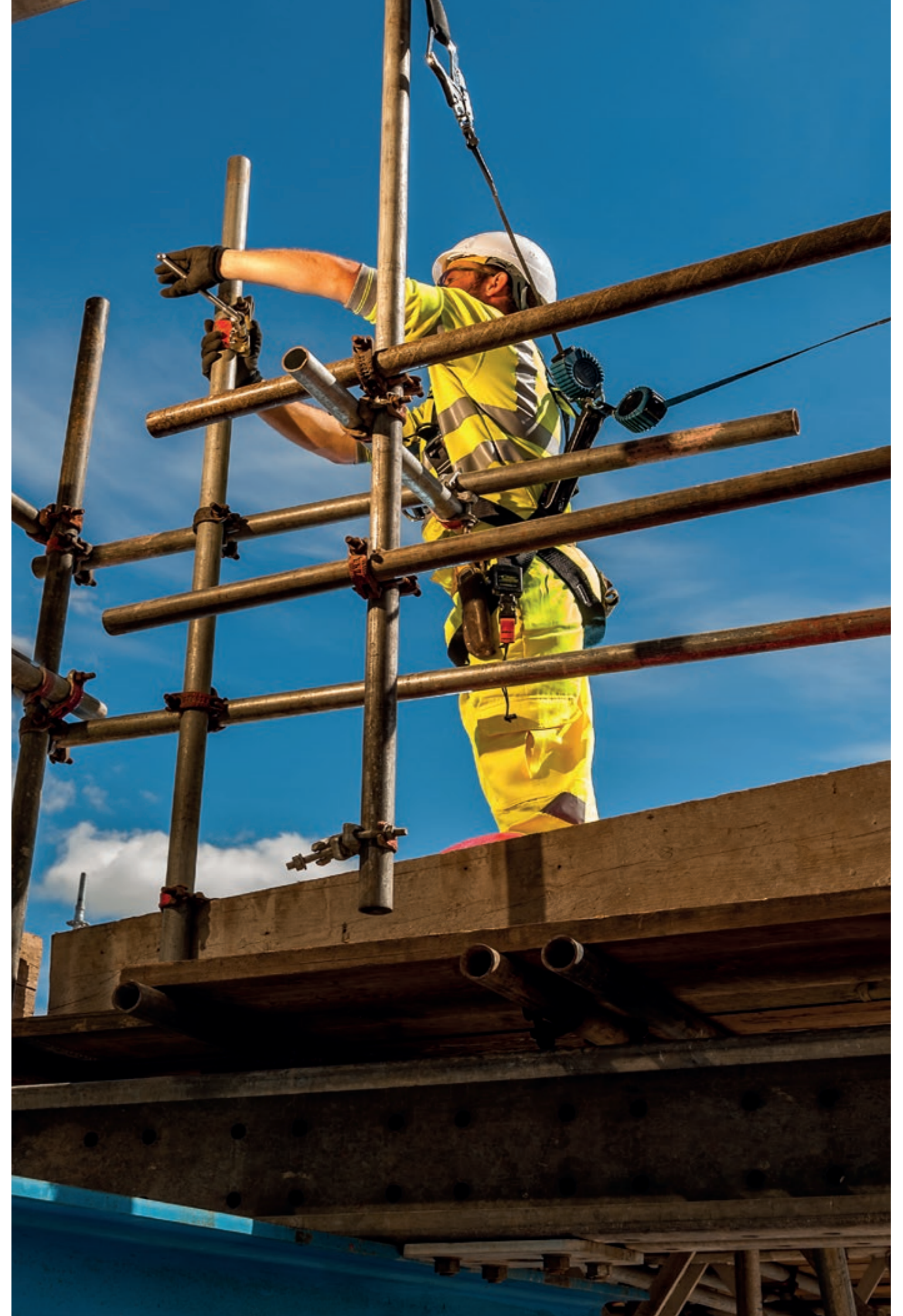
Automatic reel

Trilock carabiner for harness

Retractable belt strap

Attachment carabiner, optional

**Video clip:** Information about DSL2-Y lanyard



## HEIGHT SAFETY

### Fall arrest equipment

SpanSet Saverline



Safely work in confined spaces!



#### Mechanical fall arrest equipment „Saverline“ (EN 360)

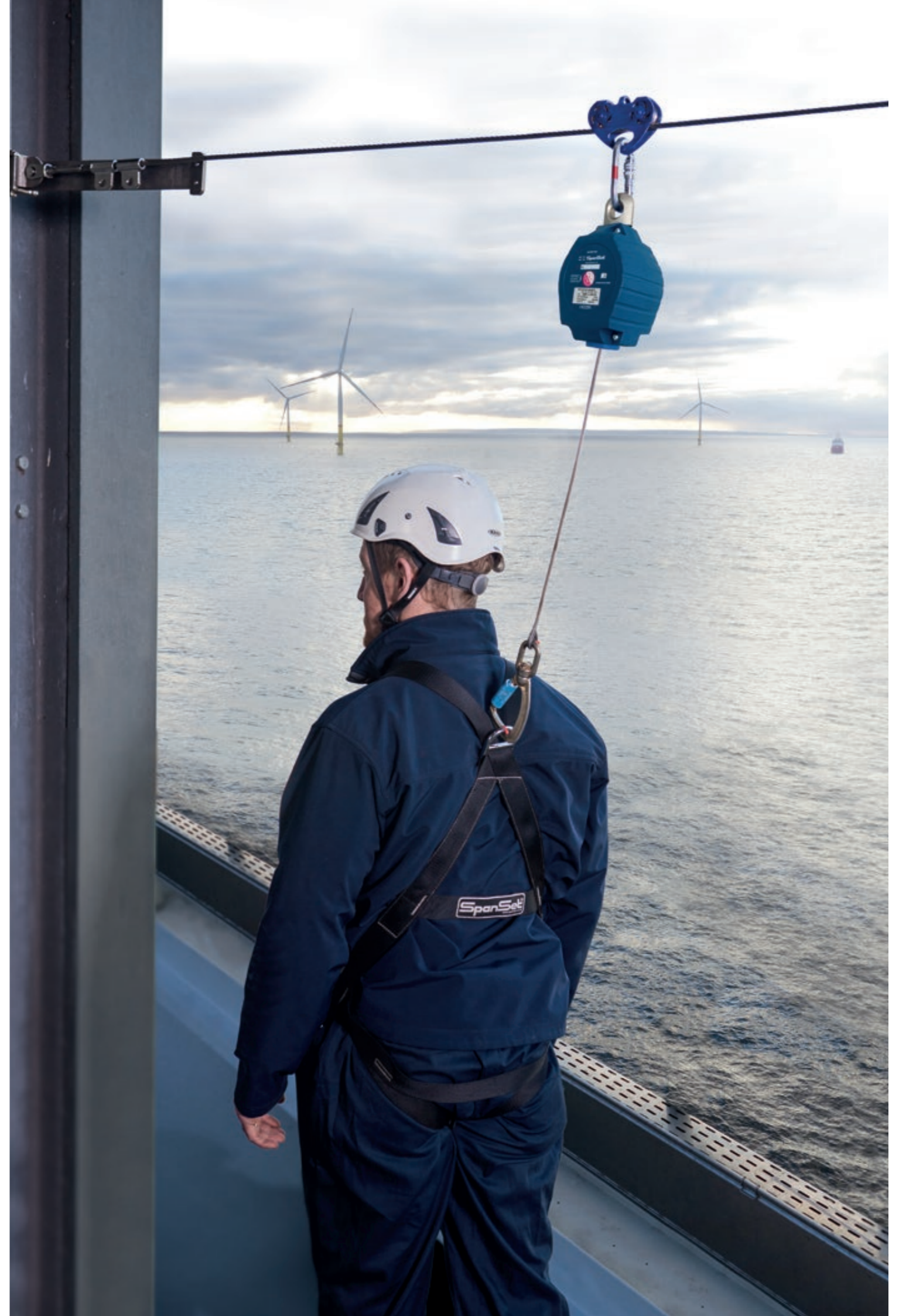
SpanSet fall arresters secure elements, for example in combination with an attachment unit during servicing and installation procedures. Saverline fall arresters operate similarly to seat belts in vehicles. A return spring permanently keeps the steel cable taut so that the device can immediately react in the event of a fall without a slack line. The integrated fall damper decelerates and safely holds the person during the drop. For maximum durability, Saverline fall arrester devices are produced with outstanding technology to meet challenging demands. All components required for the safe operation of the device are made of galvanised or stainless material, such as aluminium or stainless steel, as well as impact-resistant plastic making Saverline consistently reliable and particularly low-maintenance.

Item No.	Designation	Rope length [m]	Weight [kg]	Nominal lifting capacity [kg]	Housing	Lifting element
D072062	Saverline SRL AW1.8	1,8	1,0	136	Aluminium	Gurtband
D072066	Saverline SRL PS3	3,0	1,9	136	Kunststoff	Stahlkabel
D072067	Saverline SRL PW3.5	3,5	1,2	136	Kunststoff	Gurtband
D072068	Saverline SRL PS6	6,0	2,5	136	Kunststoff	Stahlkabel
D072069	Saverline SRL PW7	7,0	1,8	136	Kunststoff	Gurtband
D072070	Saverline SRL PS12	12,0	4,9	136	Kunststoff	Stahlkabel
D072071	Saverline SRL PW12	12,0	3,4	136	Kunststoff	Gurtband
D072073	Saverline SRL AS18	18,0	9,5	136	Aluminium	Stahlkabel

#### „Saverline“ fall arrest equipment with emergency hoisting function (EN 0360/EN 1496)

Saverline – the fall arrest equipment with emergency hoisting function and a winch unit – is used, for example, during the servicing of wind turbine towers. The winch unit can easily be engaged by a second person in the event of an emergency after a fall. Consequently, it is possible to quickly and safely recover a person following an accident. In the event of unexpected incidents the person to be rescued can be smoothly abseiled or recovered using the safety device. The emergency hoisting function features an integrated fall damper function as required by the new European, harmonised EN 1496 standard.

Item No.	Designation	Rope length [m]	Weight [kg]	Nominal lifting capacity [kg]	Housing	Lifting element
D054279	Saverline SRLR AS12	12,0	7,0	136	Aluminium	Stahlkabel
D052689	Saverline ARSL AS18	–	–	136	Aluminium	Stahlkabel



## HEIGHT SAFETY

### Fall arrest equipment

SpanSet Safeline V8  
Duo and Quattro attachment points



Be safe on ladders  
in any weather conditions

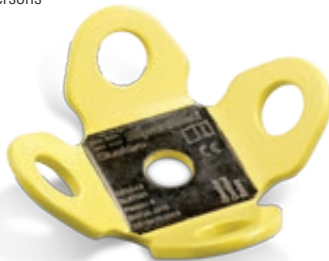
- Can be combined with fall arrester harnesses as per EN 361
- An indicator on the tensioning device helps apply the correct tension to the rope
- Disengaging is simple: one-handed not hindered by gloves.
- The system is available for delivery
- Service life: 10 years from production date

Permanently or temporarily  
suitable attachment points

„Duo“ attachment point  
for two persons



„Quattro“ attachment point  
for four persons



### Safeline V8 – rope-based climbing protection

Safeline V8 has been developed for working on buildings, wind energy systems, high-bay warehouses or in system engineering. Combined with fall arrester harnesses as per EN 361 it protects users when climbing permanently installed ladders.

The system consists of a tensioned steel cable to which a travelling fall arrester device is attached. Users attach themselves to the fall arrester device and they are then safely linked to the system from that point onwards. The runner follows users when climbing or descending. However, in the event of a fall the device locks immediately and an integrated strap fall damper minimises arrester impact forces. An 8 mm stainless steel cable is attached to the top and bottom of the ladder to install the V8. A system fall damper at the top attachment point provides additional protection for the system and ladder. The tensioning device at the bottom of the ladder applies a defined pre-tension to the guide rope. An indicator with colour-coded areas shows whether the ideal tension has been established.

The fall arrester device is connected at the bottom end of the system using a spring-loaded lock. Alternatively users can also attach it in a different position on the rope at any time. For this purpose, they must open a dual safety lock, this prevents an unintentional release of the fall arrester device from the steel cable.

### Duo and Quattro attachment points

„Duo“ and „Quattro“ attachment points have been designed to secure up to two or four persons and are suitable for installation on concrete, steel and timber. Stainless steel attachment points are suitable for M16 threads. Be it as a temporary attachment point during the construction phase or as part of a permanent protection system, stainless steel „Duo“ and „Quattro“ attachment points are the best choice.

Item No.	Designation	Dimensions [cm]	Weight [kg]	Suitable threads
D070788	Duo	120×60×35	0,2	M16
D070786	Quattro	120×120×35	0,3	M16



## HEIGHT SAFETY

### Fall arrest equipment

Grabba Bag  
Safe Lifting Kit



### Grabba Bag



#### Options:

- Plastic tub as Grabba Bags' base protection

### Lifting bags – certified to lift loads

There are plenty of lifting bags on the market, but SpanSet Grabba lifting bags are the only ones that have also been certified to lift loads. Grabba Bags are DIN EN 1492-1 certified. They are intended both as accessories for your personal protection equipment and as lifting tackle. Simply hook the crane hook into the reinforced hoisting loops to use Grabba Bag as lifting tackle. The loops feature a ring which you can attach to your fall arrester harness with a D ring, which makes it easier to link it to your fall arrester PPE.

Item No.	Designation	Nominal lifting capacity [kg]	Storage volume [l]	Height [mm]	Diameter [mm]
D036487	Grabba Bag small	75	40	320	400
D041649	Grabba Bag medium	125	63	500	400
D036488	Grabba Bag large	250	201	400	800

### Safe Lifting Kit



### Safe hoisting up to 150 kg

The Safe Lifting Kit is a block and tackle system to manually hoist lightweight loads. The system has been completely assembled and labelled as per EN 1492, so it has been approved for hoisting purposes. During annual testing the kit can be documented as a whole rather than as its individual system parts. The system's maximum load-bearing capacity is 150 kg as per the standard.

Item No.	Designation	Nominal lifting capacity [kg]	Rope length [m]
D046634	Safe Lifting Kit	150	25





# Safety Management



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## SAFETY MANAGEMENT

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Seminars and workshops



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### Practice-based seminars centring around load control, lifting and height safety

- Up-to-date expertise (regulations, legislation, standards, etc.)
- Experienced experts as instructors
- Specific application examples
- Practical exercises and demonstrations
- Useful tools for your day-to-day activities
- Comprehensive documentation
- Intensive consulting and advice

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**Online:** all seminar dates!

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View all content and dates for different SpanSet seminars online at:

[www.spanset-seminare.de](http://www.spanset-seminare.de)



#### Expertise to benefit your safety

SpanSet has been a pioneer in terms of safety ever since the company was established. Many renowned companies rely on SpanSet's specialist expertise and experience – and have often done so for many decades. SpanSet training courses can be used to refresh, broaden or enhance expertise. Staff members boasting up-to-date specialist expertise automatically improve safety within the company.

#### Practice-based content

Learning at SpanSet means learning from professionals. Each seminar is accompanied by at least one expert. Our certified experts can look back over many years of experience in load control, lifting or height safety. They know how to teach all safety aspects, both in theory and in practice, in a pleasant learning atmosphere. Seminar participants particularly benefit from professional seminar documents and the experts' ability to teach complex issues in simple ways.

#### Available to anyone

Modern facilities, air conditioning and the most recent technology as well as conscious support and catering guarantee a successful seminar. The Sicherheits-Trainings-Zentrum (STZ, safety training centre) with cutting-edge equipment in Übach-Palenberg provides an ideal learning environment. The facilities allow for the demonstration of a host of case studies, both indoors and outdoors. SpanSet additionally offers seminars at numerous sites throughout Germany, Austria and Luxembourg. We also offer in-house training courses at customer premises on request.

#### PPE, Load control and more

In addition to lifting training courses, we offer a comprehensive range of seminars centring around load control and height safety, and HGV seminars. Just have a look at our up-to-date seminar or safety management catalogue.





**We greatly value the safety of the solutions we supply. Load control, lifting and lashing equipment as well as fall arrester PPE are paramount, safety-critical products – nothing can be allowed to go wrong here.**

**1,800-metric tonne testing system**

The demands in the off-shore sector are very high – any attachment or load-handling development has always had to be subject to overload testing. Verified safety is paramount in this context.

The testing system is 12 metres long, 15 metres high and weighs more than 150 metric tonnes. Two massive hydraulic cylinders generate the maximum tension force of 1,800 metric tonnes. The hydraulic unit’s tank volume is as large as a fuel oil tank in the basement of a detached house. Load tests are controlled manually or by a computer.

**In-house testing laboratory**

The standard tension force of lashing straps and the kinetic friction of anti-slip mats are determined and certified at the in-house SpanSet testing laboratory at the Übach-Palenberg site. The most recent testing equipment at the laboratory makes it possible to carry out sharp edge testing of lifting tackle under load. Products such as the innovative NoCut protective tubes and pads were developed and certified at the testing facility by the Dekra testing institute.

**FAT – Factory Acceptance Test**

With factory acceptance tests (FAT), we verify that all technical and quality-related demands have been met before the components leave the production facilities. We help you to comply with specifications and safeguard the guaranteed quality of load-handling equipment and components. FAT includes elements, such as:

- Testing completeness,
- functionality,
- final load-handling equipment testing,
- availability of complete documentation.

**SAT – Site Acceptance Test**

Site acceptance test, or SAT for short, represent the approval of load-handling equipment directly at the site where the customer will use the equipment. SATs consist of elements including:

- Testing components,
- safety testing,
- comprehensive trial runs,
- detailed reporting.

**Handling instructions**

Handling instructions to comprehensively describe the correct application process as well as special cases are increasingly required to guarantee the correct use of load-handling, hoisting and lashing equipment, and fall arrester personal protection equipment. In addition to the general functions described in enclosed operating instructions our engineers and technicians can create hoisting instructions and lashing plans for additional applications.

**Training and operation**

Our hoisting specialists share their knowledge to guarantee the smooth operation of your load-handling equipment and the hoisting manoeuvre at hand. In some cases, hoisting manoeuvres can be particularly critical. In these cases our hoisting specialists can operate load-handling equipment for you.

**Regular testing**

Load-handling equipment, fabric lifting tackle, tools to secure cargo and devices to guarantee safety at heights must be regularly tested in terms of their safety technology in order to comply with accident prevention regulations. Our Service department employs highly qualified crane specialists, welding experts, electrical engineers and hydraulics experts. These staff members boast the required qualifications and take responsibility for ensuring compliance with statutory specifications.

**24/7-Service**

Minimising downtime in live operation is paramount. Our highly qualified service team is at hand 24/7 (requires valid service agreement), even at weekends and on public holidays. The relevant staff members have been trained in off-shore environments and can also be taken to remote areas by helicopter. Following an agreement, we can store spare parts at our service sites in Großefehn and in Denmark.

**Repairs and servicing**

We carry out regular servicing on site. Highly qualified staff undertake the servicing and errors are quickly identified and directly eliminated. If a component is not in stock, our high-performance production facilities can produce it at short notice.

**Correct handling in practice and regular servicing and testing minimise the risk of accidents.**



### Axzion Rental

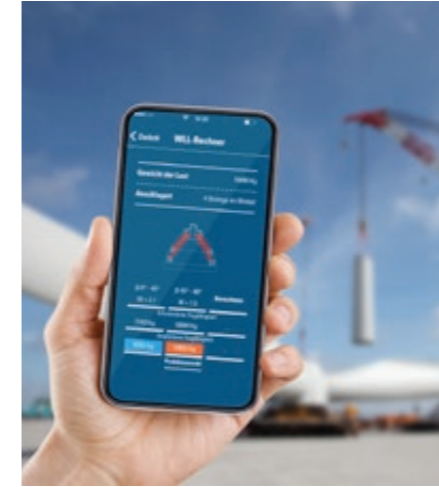
Do you urgently require load-handling equipment, but are reluctant to invest in purchasing the required hoisting equipment? No problem! From upending tools with a capacity of 1,500 metric tonnes to tower anchoring points with a capacity of 17 metric tonnes – Axzion Rental GmbH rents out tried and continuously tested load-handling equipment for installing wind energy systems, from one week to several months.



### Remote servicing

Remote servicing grants the SpanSet Axzion Service access to the status of the load-handling equipment at any time. Therefore, the control system can be diagnosed and corrective measures can be introduced.

Remote servicing optimises construction site times and minimises crane downtimes. In combination with the optional 24/7 service agreement, this means that we provide an overall service for load-handling equipment.



### SpanSet apps

#### Lashing force calculator

With the app, calculating the required amount of lashing straps is very easy thanks to the tried and tested lashing force controller. Enter the kinetic friction coefficient, inclination, pre-tensioning forces, acceleration in the direction of travel and the K-factor to directly obtain the required number of lashing straps with the provided pre-tensioning force (STF). The cargo safety value calculation is either carried out as per VDI 2700 ff. or DIN EN 12195 standards. The additional option to document the load distribution plan turns the lashing force calculator into mobile added value for cargo safety.

#### PSA-Inspector

This app accurately shows you what to look out for during regular visual inspections of fall arrester harnesses, connecting elements and hooks.

#### Vertical drop calculator

The app provides information regarding whether the vertical drop is sufficient for a host of different application scenarios. For this purpose, select the connecting element used, define the occupational situation with a few taps and let the application calculate whether a person would be protected from falling to the ground.

#### Lifting calculator

The „WLL calculator“ quickly and accurately determines the required load-bearing capacity as per DIN EN 1492-2 and 1492-1:2009. The app is the digital version of the „Hoisting force controller“. It determines the required lifting tackle for all applicable load hoisting manoeuvres using fabric lashing tackle, chains and steel cables. Choose from 14 different attachment types. You can manually enter the angles, calculate them or measure them using a smartphone.



### LAM-DocuManager

The material used in steel production and mechanical engineering must be accurately verified – a undocumented component may lead to the complete load-handling equipment being rejected. For this reason, complete documentation always forms part of the delivery scope of load-handling equipment.

Standard solutions offer the option to fall back on completed templates, complex solutions require adapted operating instructions. For this purpose, it is necessary to compile documents from various sources and manually record content, such as print documents. The correction workflow involves many channels, such as emails, telephone, etc., and this is tedious and time-consuming.

Axzion-DocuManager generates, manages and archives documentation partially automatically to organise the workflow between customers and manufacturers. Content is separated as an editorial part, prepared by the Design department and merged with the export in a PDF file. The entire process is archived within the system which can be used to view and send the documents.

The benefits are vast: universally standardised and significantly streamlined processes as well as an archive for all project-related data including revisions. Users are automatically notified about status changes to the documents. Documents can be sent using a link. The system can also be used to make use of the print service and to order documents as booklets (automated printing and logistics order without manual intervention).

**Making day-to-day activities more mobile, simpler and safer, that's our mission – also using cutting-edge methods.**

**Informationen**

Information about initial start-up and the Declaration of Conformity

**Initial start-up**

As per Article 4(1) of the German working reliability regulations (as at 2015) employers (e.g. buyers and operators of a beam) are legally obliged to exclusively provide their employees with safe tools. In order to achieve this, employers must

1. have carried out a risk assessment,
2. have identified protective measures according to the current state of the art
3. and have determined that the use of tools is safe in line with the latest state of the art. For this purpose, it is necessary to always assess the safety technology of a machine (load-handling equipment) prior to initial start-up.

In practice, initial start-up is also known as „approval“ or „initial testing“. Strictly speaking this is not entirely correct, as approval is generally a term stemming from civil law. As part of approval, the ordering party checks elements, such as whether the supplied goods are complete and undamaged. However, initial start-up mainly focuses on whether the machine meets safety technology demands as part of its intended use.

As per Article 6 of the German working reliability regulations employers must exclusively provide tools and allow their employees to use tools that are safe while taking into account the intended application conditions.

**Declaration of Conformity**

One of the most important safety specifications of a machine is that it must comply with the European machinery directive. This is verified by the Declaration of Conformity with which the manufacturer assures that the machine complies with all relevant, European specifications in terms of safety. For employers this means that the Declaration of Conformity first of all confirms that the purchased machine (load-handling equipment) is safe.

Important in this context is that the initial start-up of machines (load-handling equipment) must always be carried out by a person authorised as per TRBS 1203.

Authorised person, general, as per TRBS 1203 Appendix 2

- Completed professional training
- Practical experience with the tools subject to testing
- Expertise in handling testing equipment, assessment and test results
- Assessing which test method is suitable
- Identifying the hazards involved in testing activities
- Continuous professional development
- Maintaining practical testing experience by carrying out several tests a year

In your case, it is also required to carry out initial start-up and complete a „Test card for load-handling equipment“. This card lists all important information (design number, year of manufacture, etc.). This also involves the following sections:

1. Section 1: Testing prior to initial start-up
2. Section 2: Regular testing (usually annual, if an error rate > 2% is determined, the interval can be suitably cut)
3. Section 3: Extraordinary testing

Qualified auditor (Service) tests as per DGUV regulation 100-500 (formerly BGR 500 Sec. 3.8). Regular testing (annual testing) of a beam does not require a new or additional load test. This may only be optionally required for extraordinary testing, i.e. following major repairs or a complete revision after more than five years. It is particularly important for beams to use a Service department that checks this regularity. Auditors are experienced enough to distinguish cracks in the paintwork from cracks in weld seams.

Regular testing involves elements, such as a

- visual part (visual inspection for deformation, overloading, cracks, etc.)
- Special section (electrical test as per DGUV regulation 3)



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