



Aktion

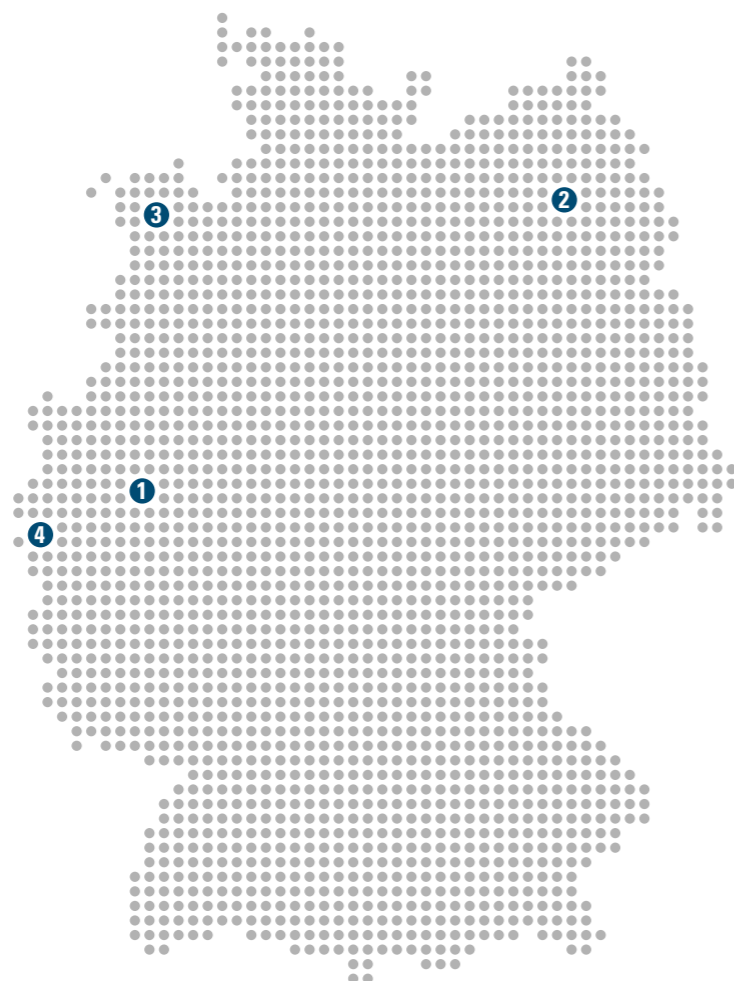
Engineering
Lifting Equipment
Technical Services

QUALITY SEVEN

SpanSet
GROUP

Locations

- 1 Langenfeld**
Headquarters and production site
- 2 Neustrelitz**
Production site
- 3 Großefehn**
Service point
- 4 Übach-Palenberg**
Technical sales and design



Contents

SpanSet Group and Axzion	4	Q5 Drives and control technology	44
Why Axzion is the right partner	14	Hydraulics	48
Q1 Consultation	16	Electric	48
Standard or individual solution	20	Remote controls	49
The position of the load's centre of gravity	21	Cameras / Light sources	49
Q2 construction	22	Q6 Testing and documentation	50
Optimum load handling equipment	24	Weld seam and material testing	52
through specialisation	24	600 t test stand	55
Load change	25	3,000 t test stand	55
Maximum 20,000 load cycles	26	Axzion-DocuManager	56
Operating temperatures	27	Q7 Service	58
Lifting speed	28	Tests based on accident	60
Special operating conditions	29	prevention regulations	60
Q3 Material	32	Repairs and maintenance	60
Optimum function, best components	33	Training and operation	62
Only with certificate	34	24/7 service	63
Flame cutting	34	Remote maintenance	63
Documented schedule of application	34	Risk analysis/hazard assessment	64
Q4 Manufacturing	36	Handling instructions	65
DIN EN 1090	39	Standards, regulations, codes of practice	66
Production supervision	42		
Certified welders	42		
Modern production machines	43		
Favourable prices due to high efficiency	43		



National competence – positioned globally

SpanSet Group Germany

SpanSet GmbH & Co. KG

SpanSet is the group’s specialist for textile slings, such as lifting slings and round slings with load capacities of up to 450 t, innovative load control equipment and personal safety equipment to protect against falling (PSEAF). For over 50 years, the company has set the international pace in the load securing industry and the field of lifting technology.

SpanSet Axzion GmbH

SpanSet Axzion is one of the world’s leading manufacturers of load suspension devices. Here, the development of individual solutions is the norm: Over 80 % of all lifting devices are special solutions for special tasks in the fields of lifting, gripping or turning. Developed and manufactured in Germany, the load handling equipment stand for the highest quality standards.

SpanSet secutex GmbH

SpanSet secutex is the market leader in the fields of coated lifting straps and protective hoses. With creativity and knowledge, the range of applications is constantly being expanded. Protection against impact, protection against sound, the protection of surfaces (e.g. coating of rollers, protective hoses, fixed coatings, edge protectors) and individual solutions are part of the daily business.

A global player with a worldwide presence



SpanSet Group international



Around 800 employees are positively responsible for the fact that SpanSet has developed into one of the international market leaders in the fields of load securing and lifting technology, height safety and safety management. With its own production and sales companies in all important industrial countries and a worldwide network of factory representatives, SpanSet knows the rules and can guarantee comprehensive service on site. Meanwhile, 22 production and sales companies distributed over 20 countries now belong to the SpanSet Group.

From the strand to the lifting strap, from the ratchet to the lashing strap and from steel to load suspension device: The companies of the SpanSet Group are producers and as such, they are able to supply you with customised products and special solutions for the difficult requirements of transporting and assembling wind turbines or other large components.

We take responsibility

A manufacturer is the person who „bears the responsibility for the design and manufacturing of a product“ which is placed on the market in his name.

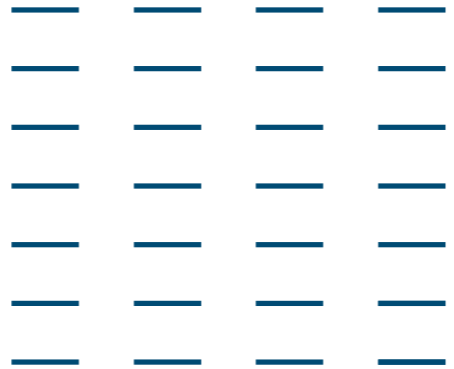
If operators design and manufacture their own load suspension devices, they become the manufacturer. Time and again, insufficient attention is paid to the dangers and liability risks involved in lifting and moving heavy loads - with sometimes dramatic consequences for those responsible and affected.

Buy from a specialist. Even the selection of an unsuitable manufacturing company can lead to personal liability.

Starting with the manufacturer's qualification for welding in accordance with DIN EN ISO 3834-2 and the manufacturer's certification in accordance with DIN EN 1090-1 through to the factory production control for load-bearing components up to EXC3 in accordance with EN 1090-2 and the quality management system in accordance with DIN EN ISO 9001: With Axzion, you buy from a company that works in absolute compliance with the standards.



Why our expertise generates responsibility



Why our load suspension device is a competitive advantage

Design, welding, testing, documentation, service: Several companies are often involved in larger projects. Parallel working is difficult because everyone involved has to complete their work before the next person can start. Responsibilities are sometimes not clearly assigned and through the use of modern manufacturing machinery, opportunities are not exploited.

Axzion offers everything from a single source

The development, production and service processes are closely interlinked. Any difficulties that arise can be solved quickly and the design is optimally adapted to modern production possibilities. In case of problems our service team provides immediate help. Your employees can be directly instructed in the use of the load suspending device supplied by us.

Due to the considerable investments in the fields of power generation as well as gas and oil production, an increasing number of large load suspension equipment that is needed. The unit weights are steadily increasing. Many assemblies are already sent on their journey pre-assembled. Lifting solutions are sometimes needed very urgently. The costs for missing load handling equipment can be extreme. SpanSet Axzion GmbH is able to deliver complete assemblies in a very short space of time, complete with acceptance, e.g. by DEKRA or Germanischer Lloyd, and load testing on in-house test stands (600 t and/or 3,000 t).

A low-angle, upward-looking photograph of a large industrial crane lifting a massive, dark metal structure. The structure is composed of a grid of beams and features several large, red-painted gears or pulleys. The crane's blue arm and cables are visible against a clear blue sky. The text "Why our customers are also our „drive“" is overlaid on the left side of the image.

Why our customers are also our „drive“

Ever larger components and the associated higher loads that our customers operate with regularly present us with new challenges. Therefore, the further development of load suspension equipment never stands still at SpanSet Axzion GmbH. In particular, onshore and offshore industries are constantly placing new demands on lifting technology. As a leading developer and producer of load handling equipment, it is our mission to always offer our customers the safest, and at the same time, most economical option for the required application. Consultation, development, production – in every area, absolute professionals and their specialist knowledge are at the customer's side for every project. Together, they create the optimal solution for the respective requirement.

Why Axzion is the right partner

Precise planning guarantees perfect function

Specialists with comprehensive expertise are employed during the consultation and planning phases. These are able to find and implement the optimal solution for the customer.

Optimum development through specialisation

More than twenty experienced designers in the field of load handling equipment with a special knowledge of statics, welding and drive technology design the right load suspension device for your needs.

Drives and control technology

We have many years of experience in the development of load suspension devices with intelligent control technology and electro-mechanical or hydraulic drives.

Material and process testing

The material and the work are documented and, of course, certified by our own inspectors / independent inspectors using the latest testing equipment.

Design of load handling equipment

The number of load cycle is decisive. In order to ensure that the design of the new load handling device is correct, Axzion projects the exact intensity of use in advance.

Special operating conditions

Not all load suspension devices are used with a crane. If, for example, forklift trucks are used, this changes the design. We take this into account during the planning stage.

Load test on our own test stands

The demands that are placed on lifting and load suspension devices are enormous. Manual and computer-aided overload tests can be carried out on the two, in-house test stands.

Proper proof of manufacture

At Axzion, full documentation is always part of the delivery of load suspension devices and is just as important as the delivered component itself.

The right material

A safe, good solution can only be produced with good components. For many years, we have only worked with the best steel and component suppliers.

Production at the highest level

Certified welders, production supervision by experienced welding engineers and modern production machines ensure the highest quality production.

Maintenance, repair and operation

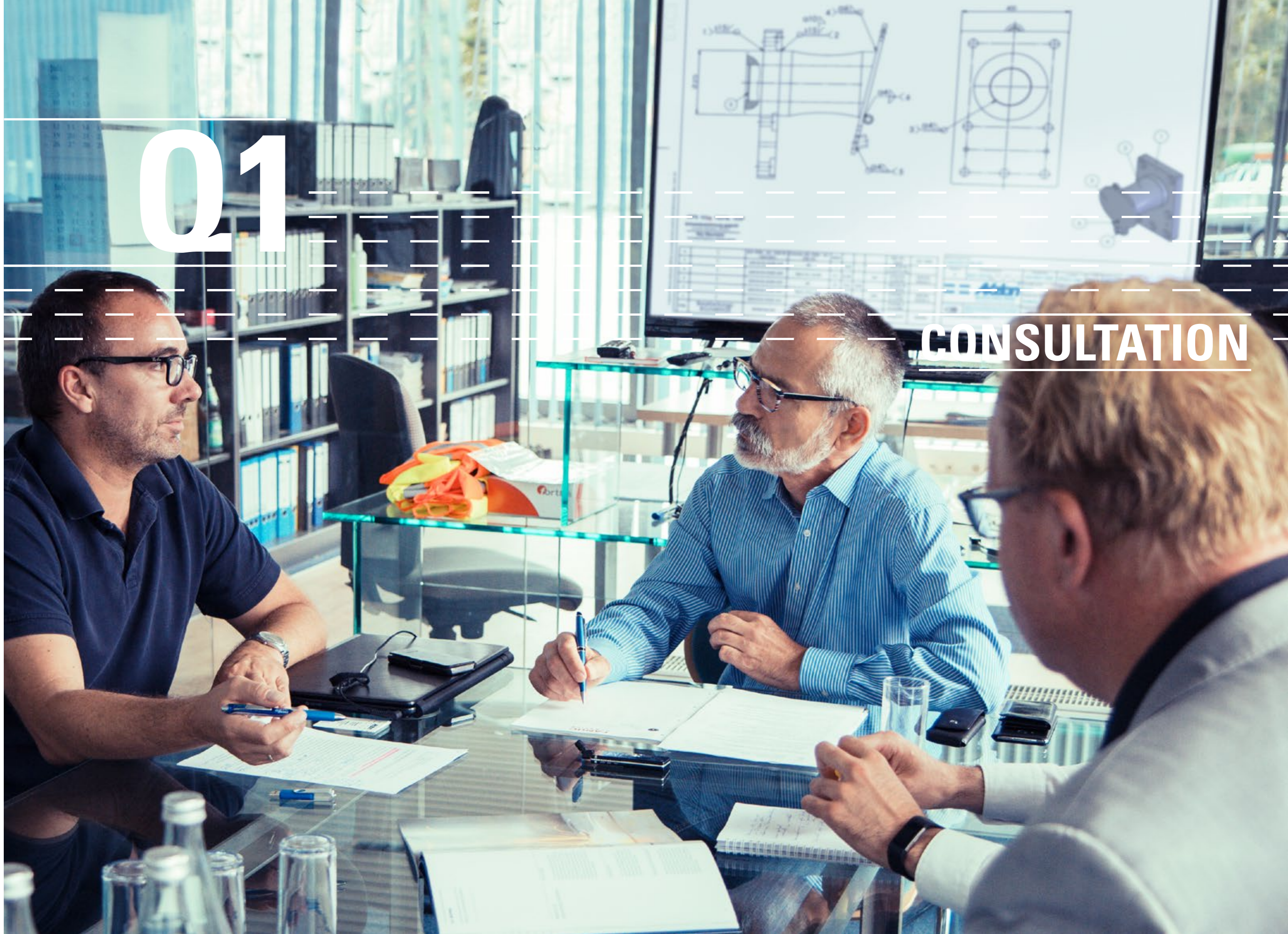
To minimise downtime during operation, the Axzion service team is available to the customer for maintenance, repairs as well as operation of the load suspension device.

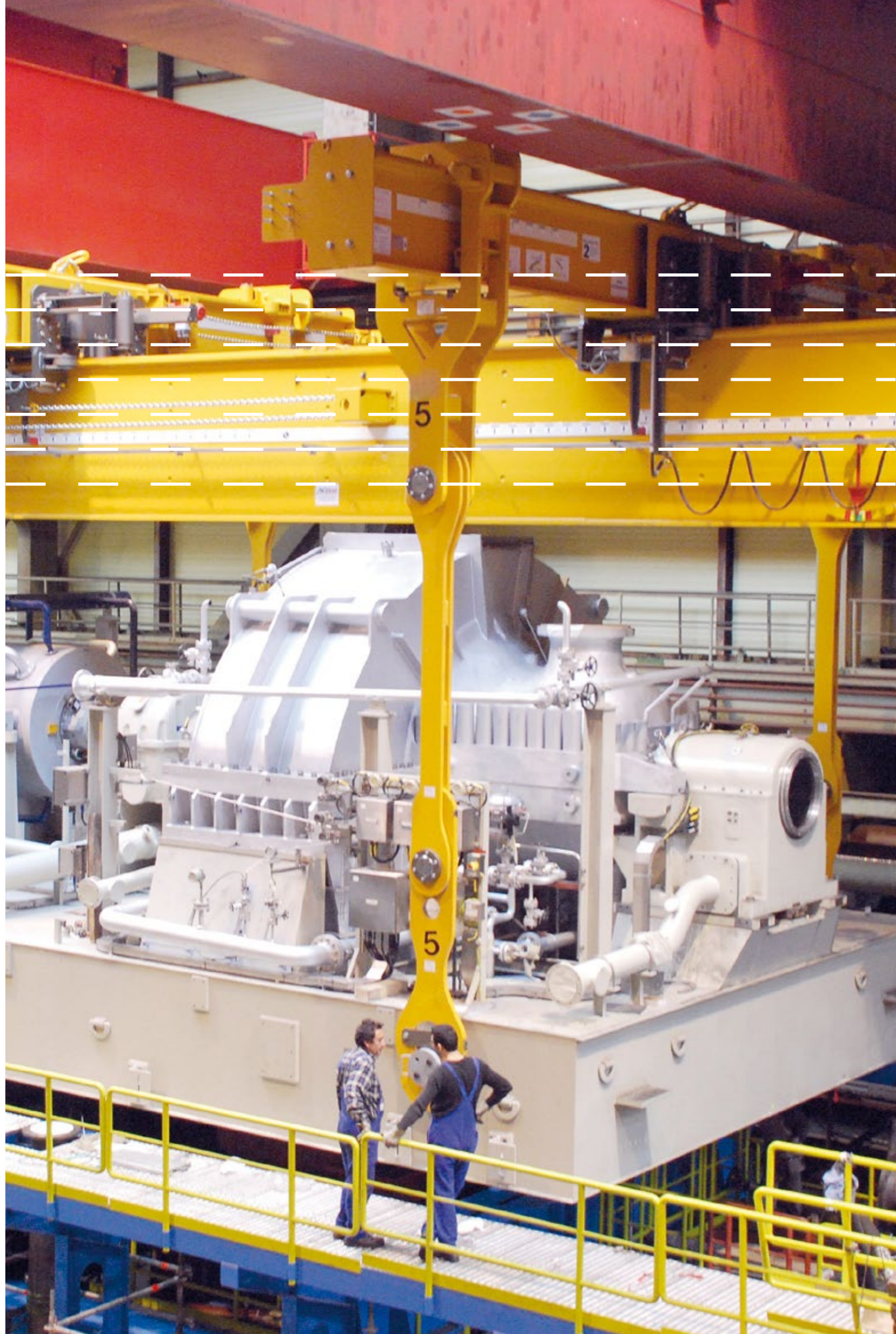
Handling instructions

Highly qualified lifting specialists, technical writers and graphic designers work with the operator to create the handling instructions required for the operation.

01

CONSULTATION





Precise planning guarantees perfect function

Starting in the planning phase, intensive contact with the user enables us to develop the optimum concept for the requirements. The design with the latest 3D CAD systems and computer-aided calculation programmes (FEM) enables us to process or make changes at any time. A trained team of experienced consultants brings the full potential of a multitude of solutions to the consultation.

The application engineer is happy to visit the customer in order to get an idea of the respective application conditions and requirements on site. In the case of internal special features, a further risk analysis may be necessary, for which we are glad to be at the customer's disposal.

Intelligent load suspension devices

Standard or individual solution

We provide you with the correct advice

The right advice is always a question of your own possibilities. As a manufacturer, we are always in a position to find the right solution for you. This applies to both a price-oriented and a solution-oriented approach. This is where approx. 84 % of modified standard or individual solutions from our company speak a clear language:

Only about every sixth piece of load handling device that leaves our company is a standard solution.

AXZION's own design and production means that we have a large number of individual design elements at our disposal, which can be combined into a complete solution in modular form if required. In this way, even customised products can be realised in a very short delivery time. For the customer, this means receiving exactly the right solution - regardless of whether it is a cost-effective standard solution or an individual customisation.



The position of the load's centre of gravity

The load's centre of gravity is always exactly under the crane hook. If necessary, the load will tilt accordingly, together with the load handling equipment. It should be noted that the unplanned inclination of a lifting beam may be 6° max. in accordance with DIN EN 13155. This specification must be taken into account in the design. Angles of inclination greater than 6° must be specified separately and secured by special design measures. If the load is attached below the load's centre of gravity, this can lead to an unstable position which, in the worst case, can result in the load overturning.

The exact position of the load's centre of gravity and the position of the attachment points must be known at the design stage. Special design measures may be necessary. For the technical advice that is absolutely necessary in this case, AXZION is at the customer's side with its professional expertise.

Q2

CONSTRUCTION



Experience and modern technology

Optimum load suspension devices through specialisation

More than twenty experienced load suspension devices designers with specialist knowledge in the fields of statics, welding and drive technology design the optimum solution for your needs.

Vocational learning is very important at AXZION: All employees are continuously trained and educated. Specialists from DEKRA or TÜV, the employers' liability insurance association and renowned suppliers ensure that knowledge is regularly updated so that new standards are implemented immediately. New knowledge is also transferred internally. In internal training courses, experienced developers pass on their expertise to new employees.

The development teams work with state-of-the-art IT and the latest software. The designs are created in 3D with Solid-Works and verified with the integrated FEM software. Static verifications are created with MathCad or RStab.



Load change

The number of load cycle is decisive.

In cooperation with the user, the designer of load suspension devices must determine whether DIN EN 13155 „Cranes - Safety - Loose load handling equipment“ can be applied or whether the load handling attachment must be designed in accordance with Eurocode 3-DIN EN 1993 „Design, construction and execution of steel structures“.

Therefore, for the load suspension devices to be designed correctly, a projection of the intensity of use is necessary. This is where the following values are of importance:

Factors for determining the design

Planned service life	Operating time in years
Lifting operations per day	Multi-shift operation with >20000 load cycles are to be expected in accordance with VBG9a.
Load change per lifting operation	Load change is the change between the unloaded and loaded state from 50 % of the maximum permissible load capacity of the load handling equipment.

Calculation example design „A“

Service life	4 years 250 working days 1 shift operation
Lifting operations per day	2
Load change per lifting operation	2
Calculation	4 x 250 x 2 x 2
Result	4.000
Application	DIN EN 13155

Calculation example design "B"

Service life	10 years 250 working days 1 shift operation
Lifting operations per day	40
Load change per lifting operation	4
Calculation	10 x 250 x 40 x 4
Result	400.000
Application	Eurocode 3 / DIN EN 1993

Experience and modern technology

Safety note

Please consider possible changes of use during operation (e.g. Change in frequency of use if the load handling equipment is relocated to another department).

Maximum 20,000 load cycles

If maximum load changes of up to 20,000 are to be expected for the load handling equipment to be constructed, EN 13155 „Cranes - Safety - Loose load handling equipment“ is applied in full. This means that the mechanical load bearing parts must meet the following requirements in terms of mechanical strength:

I) The load handling equipment must be dimensioned to withstand a static load of three times the load capacity and to hold the load even if permanent deformations occur.

II) The load handling equipment shall be designed to withstand a static load of twice its working load limit without permanent deformation.

III) A further, not insignificant requirement is made in section 6 of EN 13155. For individually designed and manufactured products, both a type test and an individual test are required. For serial products, the type test must be carried out on one or more representative products from the series as well as the individual testing on each individual manufactured product.

IV) The manufacturer of the load handling equipment must provide evidence that the welding work was carried out by personnel tested in accordance with DIN EN ISO 9606-1 „Testing of welders - Fusion welding“. In addition, it is necessary to verify that the quality of the welds complies with DIN EN ISO 5817 „Evaluation of welds“.

DIN EN 13155 does not cover the hazards associated with the mechanical strength of load handling equipment which is intended for more than 20,000 load cycles. Load handling equipment that has been designed according to DIN EN 13155 must therefore be taken out of service after 20,000 load cycles.



Operating temperatures

The operating temperatures must be known at the time of construction. The normal load handling equipment is used in a temperature range between 0° C and +80° C.

When used outdoors, temperatures as low as -20° C can be reached. In some regions of the world, even temperatures as low as -40° C are possible. In such cases, steels with a low temperature resistance are used.

When transporting hot loads, on the other hand, very high operating temperatures are possible. In this case, special steels must be selected that are suitable for these special operating conditions.

Lifting speed

The load handling equipment must be designed for the lifting speeds that occur. A maximum of 10 m/sec. is usual. In order to speed up the loading processes, significantly higher speeds are possible, e.g. in handling operations (port, steelworks, etc.), and these must be known at the design stage.

Experience and modern technology



Special operating conditions

Forklift

Not all load handling equipment is used in conjunction with a crane. An important and widespread application is the use of the load handling equipment together with a forklift truck. Here, the dynamic loads on the load handling equipment are significantly higher. The lifting speed is usually much higher than with a normal crane.

Due to the possible movement of the forklift together with the load handling equipment and the load, many load changes can take place in a very short time. This must be taken into account in the dimensioning process.

Offshore

The requirements for load handling equipment are particularly high when used offshore. The design and construction are strictly monitored.

Wind and waves can be enormous in terms of dynamic forces. Working on the high seas is dangerous. The load handling equipment must be easy to operate and particularly safe.

Provide us with full details about the application and its use so that we can design the right load handling equipment for your application.

Q3

MATERIAL



Optimum function as a result of the best components

A safe, good solution can only be produced with good components. We have been working for many years exclusively with the best steel suppliers. As such, the tested steels in blasted quality are mainly obtained from Arcelor, Union Stahl, ThyssenKrupp and Carl Spaeter.

When selecting the heavy plates to be processed, we focus on fine-grain structural steels with high strength and toughness characteristics, in addition to optimum weldability (e.g. a low cold cracking tendency) and very good machinability.

As such, the choice often falls in favour of different thermomechanically rolled steel grades (also called TM steels for short). The stainless steels that are used must have excellent resistance to a variety of abrasive media and as such, high oxidation resistance. Here, the choice falls predominantly in favour of so-called austenitic stainless steels (non-magnetic) whose Ni content corresponds to $\geq 2.5\%$ (from material number 1.44...).

Chain components

The chain components mainly come from RUD Kettenfabrik in Aalen. The shackles come from van Beest and the wire ropes come from Henschel. Renowned drop forges, such as Peter Schöttler in Hagen, supply us with the crane hooks and suspension eyes.

secutex

SpanSet-secutex is the leading manufacturer of plastic parts for material protection. Thanks to our own high-performance mould construction, special solutions can be produced quickly and cost-effectively. Optimum planning is important: secutex impact protection elements are an integral part of the load handling equipment that is supplied. The parts subject to regular wear and tear can be replaced quickly and easily.

SpanSet

And the textile slings, such as hoisting belts and round slings, naturally come from the parent company SpanSet. The large production facility in Übach-Palenberg enables lifting solutions, even in the „super“ heavy-duty range. Repairs and express deliveries guarantee a high availability of the lifting equipment that we supply.

Material from renowned manufacturers

Only with certificate

We require at least an acceptance test certificate (3.1) - in accordance with DIN EN 10204 - from the manufacturer for all the materials that are used. For offshore applications, acceptance test certificate 3.2 - in accordance with DIN EN 10204 - can also be issued by an independent expert appointed by the manufacturer. Our suitably qualified employees carry out systematically defined incoming goods inspections and it is only then that they release the supplied material for production.

Flame cutting

Perfect flame cutting quality and complete traceability of the material that is used are very important to us. Flame-cut parts are produced on modern CNC-controlled flame-cutting or plasma-cutting machines and the finishing is carried out on modern edge milling machines.

Documented schedule of application

Steel is only used in production if the acceptance test certificates and/or acceptance test reports are available and the material has been approved by our in-house quality assurance department. All material certificates and test reports, as well as their schedules of application, are managed and archived with the aid of IT. As such, they are available for an unlimited period of time and can be retrieved at any time.



Q4

MANUFACTURING





DIN EN 1090

When producing steel construction projects in the field of building supervision, specialist companies must comply with the technical standards that are valid throughout Europe. Now, contracts for metal structures (e.g. welded steel structures) may only be awarded to specialist companies that meet the normative requirements and have been tested and certified by a recognised body.

Companies that want to manufacture welded steel structures or weld onto existing steel structures must prove that they have qualified personnel and suitable operational facilities. Certified companies must have their suitability checked regularly. This includes, among other things, the fulfilment of welding quality requirements in accordance with DIN EN ISO 3834 at the corresponding quality level.

The specialist company has to fulfil the following conditions in accordance with DIN EN 1090 for the production of load-bearing structures in the field of building inspection:

Part 1

Verification of the conformity procedure for load-bearing components

Part 2

Technical rules for the execution of steel structures

The requirements to be fulfilled by the specialist company are based on the respective execution class (EXC) of DIN EN 1090-2. Depending on the load on the structure, steel material, damage class and other criteria, there are four execution classes ranging from EXC 1 to EXC 4.



AXZION is approved for class EXC 3. The highest class EXC 4 does not apply to load handling equipment.

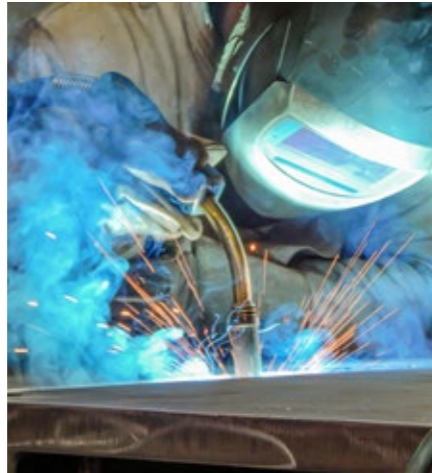
Class EXC 3 applies to load-bearing structures with a high damage sequence class, which are mainly subjected to static or dynamic loads, as well as to steel materials with a yield strength > 355 MPa.

Companies within the scope of classes EXC 3 must employ a qualified welding supervisor and certified welders with a valid welder certificate in accordance with DIN EN ISO 9606-1, as well as welding procedures with a valid qualification (WPQR).

DIN EN 1090-1 requires a certificate of factory production control and a welding certificate issued by a recognised body after an initial inspection (initial surveillance). The specialist company is subject to regular monitoring of the factory production control procedure.

Confirmed by DVS ZERT

AXZION has the manufacturer's qualification for welding in accordance with DIN EN ISO 3834-2 and the manufacturer's certification in accordance with DIN EN 1090-1 through to the factory production control for load-bearing components up to EXC3 in accordance with EN 1090-2 and the quality management system in accordance with DIN EN ISO 9001.



DIN EN 1090

Manufacturing support by experienced welding engineers

The welding engineer checks the designs for welding suitability. The welding procedure and the welding sequence are specified in a WPS (Welding Procedure Specifications) in accordance with EN ISO 15609-1.

„Welding WPS“ means that the welding is carried out according to a tested welding procedure check (WPQR). It serves as a guide to how the weld is to be made and which adjustments the welder has to make on his welding equipment for this purpose. It also contains information concerning the preparation of the weld and the finishing of the weld.

Certified welders

The quality of the welded joints we produce is very important to us. All welders have valid examination certificates in accordance with DIN EN ISO 9606-1 and are continuously trained by us in-house.

Only the latest welding equipment is used, which is regularly checked and continuously renewed.

Modern production machines ensure optimum results

Our production facilities are equipped with modern processing machines which are in mint condition. This is the only way to achieve perfect quality at a favourable price. All flame or plasma cutting machines are CNC-controlled. Several large boring mills and portal milling machines guarantee high production quality. We work according to the usual standards in mechanical engineering. Spare parts can be produced and dispatched at very short notice. Adaptations to the load handling equipment are usually not necessary.

A modern CNC-controlled machine is only as good as its operator: Our specialists are continuously trained in-house and, of course, we train our skilled workers of tomorrow. The assemblies which are designed are transferred directly to the machines via Solid-CAM, thus minimising transfer errors.

Favourable prices due to high efficiency

We have a CNC-controlled sawing and drilling machine for the cutting and processing of beams. The steel profiles are automatically cut to size and drilled directly.

Perfect weld seams and great speed: Welding assemblies are produced on our large Cloos welding robot and FANUC gantry robot with eight controlled axes.

We can realise labour-intensive assemblies at low cost in our own production facility in the Czech Republic, where the necessary welding approvals are of course also available.

Optimal logistics are especially important for large welding assemblies. The high and spacious production halls with many overhead and slewing cranes ensure perfect line production. If there is an urgent need, the production capacity can be massively increased at short notice.

Q5

DRIVES AND CONTROL TECHNOLOGY





Drives and control technology

Intelligent load handling equipment increasingly has electromechanical or hydraulic drives. In many cases, the standard elements from mechanical engineering are not sufficient because they are not dimensioned to a sufficient extent or are not fault-tolerant.

Failure of the load handling device must be ruled out with absolute reliability. The load must be held safely under all circumstances. The demands on the control systems are also extremely high, so that the systems have to be designed redundantly in some cases.



Reliable function,
multiple protection

Hydraulics

Hydraulic cylinder

AXZION has the appropriate machining equipment and manufactures the large lifting cylinders itself. The attachment points are dimensioned to withstand the load and the seals are sourced from qualified suppliers. The delivery times for such cylinders are often extremely long. We can supply replacements at short notice.

Hydraulic drives

AXZION has the hydraulic drives for the offshore sector built to its own specifications. These very compact drives have two hydraulic pumps that sit on a common tank. If the main pump should ever fail, the lifting process can be easily terminated by the auxiliary pump.

Hydraulic components

The components, such as valves or hoses, are mainly purchased from a supplier represented throughout Europe, so that replacements can be supplied at very short notice. System-relevant valves are partly designed to be redundant so that the failure of a component does not lead to a system failure.

Electric

Generators

AXZION has the generators for offshore operation supplied according to its own specifications. Two generators always work in parallel. If one of the two should fail, the second can complete the lifting process.

Electric drives

Only electric drives from renowned German manufacturers are installed, which have proven their suitability many times over. The design is appropriate for the load. The heavy conditions in the lifting operation are generously taken into account.

Controls

The controls have a modular design and have been tested many times. The assembly is carried out by our own electrical engineers. This means that the control system can be tested directly and adjusted if necessary.

Remote controls

AXZION has the remote controls built according to its own specifications by a supplier that is represented throughout Europe.

For offshore use, we can measure possible frequency interference on deck and then adjust the remote control unit that is supplied to suit.

Safety-critical functions are blocked by key systems. The functions can only be used when using the securely deposited second key.

Transmission of the function-related messages via WLAN is possible. This makes it easy to carry out an analysis via remote maintenance.

Cameras / Light beams

Some functions of the supplied load handling equipment must be additionally monitored, because not every area can be optimally viewed.

For this purpose, we supply suitable multi-camera systems with radio transmission to split screens.

Night becomes day: Of course, we also supply the load handling equipment with high-power LED spotlights.

Q6

TESTING AND
DOCUMENTATION

DNV·GL

Weld seam and material testing

Weld seam and material testing

Material testing and process testing means additional safety. Our work is inspected by our own or independent inspectors using the latest testing equipment. All certifications are, of course available. We test during production itself. The final tests that are required are always carried out by a neutral testing institute.

Magnetic particle testing

Magnetic particle testing is the most frequently used method for detecting surface defects and defects close to the surface, such as hairline cracks on magnetisable iron and steel materials. The flux leakage caused by the magnetisation of the component at surface cracks causes the magnetisable particles that are present in the test medium to adhere. The effect is visible and results from the contrast between the substrate and the test medium.

Dye penetrant testing

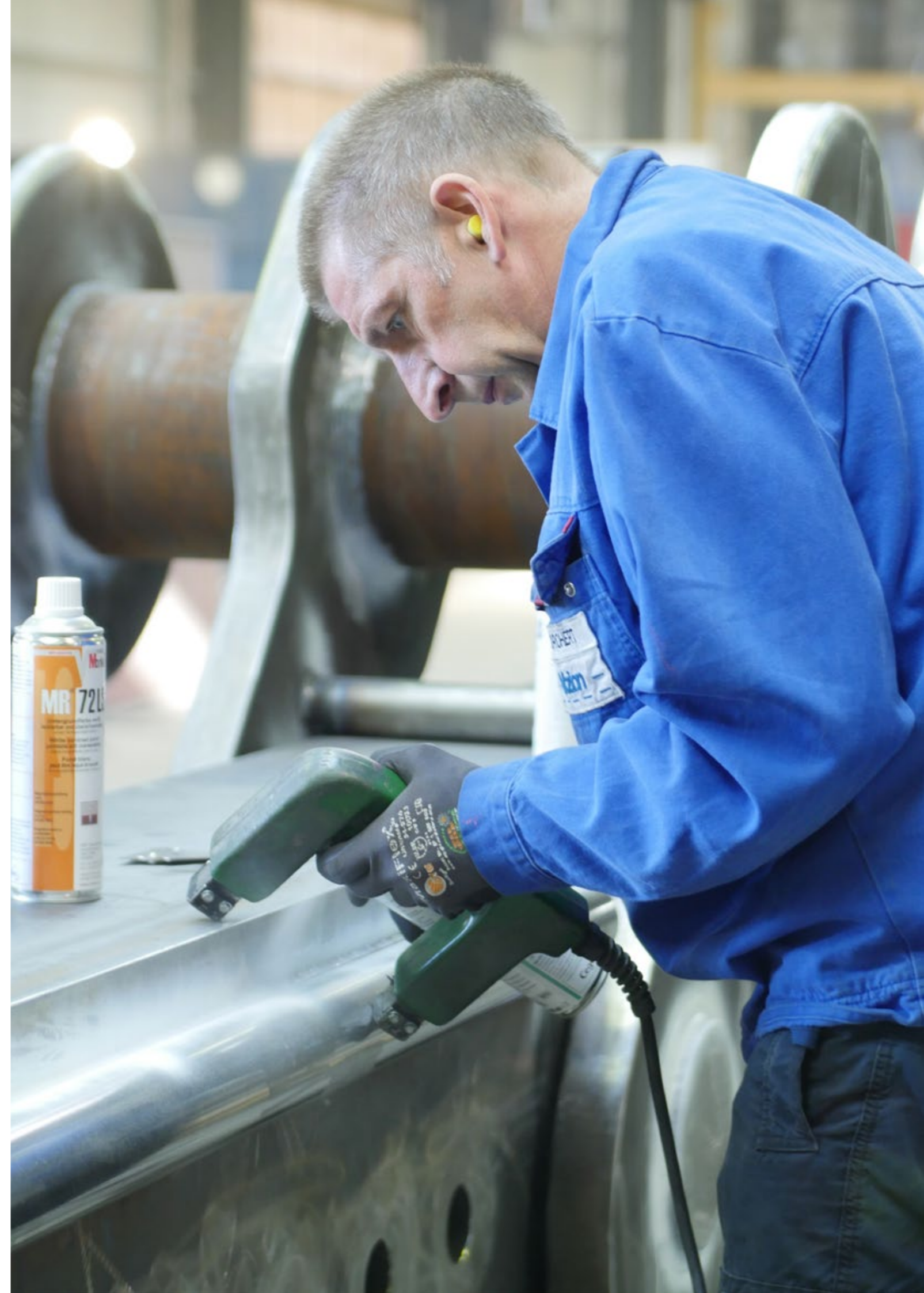
The dye penetrant method is one of the oldest non-destructive testing methods for detecting surface defects. The test can be performed on almost all metallic and non-metallic materials. In this method, the test liquid penetrates into surface defects of any type of material due to capillary action. After carefully washing off the solution, a developer layer is applied to create counter-capillarity. This draws out the liquid that has penetrated into cavities and cracks and makes the defect visible.

Ultrasonic testing method

The ultrasonic testing method is particularly suitable for detecting defects inside and outside of sound-conductive materials and thus within the entire cross-section of the workpiece. The acoustic method for non-destructive material testing is used for the quality assurance of pipes, weld seams and cast components as well as for determining wall thickness.

Notch impact bending test

How tough can a material be? Notch impact bending tests are carried out to assess the toughness of a metallic material, even at the lowest temperatures.



Load test

SpanSet Axzion works closely and in partnership with the major testing organisations such as TÜV, Dekra, Lloyds Register and DNV GL.

New designs are often discussed in advance and the required safeties are jointly determined. The inspectors are at our premises almost every day in order to carry out the necessary construction-related supervision of the large load-bearing equipment or to accompany the load tests that are required.

The requirements in the offshore sector are enormous – all slings and load handling equipment have always had to be tested with and overload. The intensive continuous loads caused by waves, wind and the difficult operating conditions place particularly high demands on the lifting equipment. This is where proven safety is the top priority.

Turbines, gas compressors, wind turbines are loads with a very high value. Damage during transport must not occur under any circumstances. This is because the extremely long repair and replacement times would cause dramatic economic damage.



600 t test stand

The test facility, which has been at the Langenfeld site for years, has a length of 20 m, a height of 5 m and a dead weight of more than 100 t.

The load tests are controlled by manual operation or computer-controlled with an evaluation. The NRW Material Testing Office (Materialprüfungsamt NRW) has confirmed the accuracy of the facility. All measured values are calibrated and certified.

The test stand is open to all; This is where other load handling equipment can also be tested at short notice.

Large testing companies, such as Lloyds Register, Germanischer Lloyd and Dekra have already accompanied load tests on the test stand and were enthusiastic about the effortless handling.

It has been possible to carry out extensive test series, such as the testing of new tower slinging points in peace under absolutely realistic operating conditions.

The testing of existing load handling equipment in accordance with DIN EN 13155 will also gain in importance in the future. A load test with a twice the overload is able to prove the suitability of the lifting solution in accordance with the standard. The accompanying expert from the neutral testing company confirms the test result.

3.000 t test stand

Until now, the overload tests of very large lifting constructions have been extremely difficult and costly. For example, a floating crane had to be hired in order to test a large 800 t lifting beam.

A total of ten people were employed over a period of several days in order to attach the test weights and carry out the test. The total costs for this load test exceeded the value of the supplied lifting solution several times over.

The test stand has a length of 12 m, a height of 15 m and a dead weight of more than 200 t. The test weight of the test stand is over 3,000 kg. The maximum tensile force of 3,000 t is applied by two huge hydraulic cylinders. The tank volume of the hydraulic unit is as large as the heating oil tank in the cellar of a detached house. The load tests are controlled manually or by programmable logic controller.

Documentation and document management

Correct manufacturing, comprehensively proven

Documentation is just as important as the manufactured product. In the international steel and mechanical engineering industry, the materials that are used must be accurately verified; an undocumented component can lead to the rejection of the complete load handling equipment. Full documentation is therefore always part of the scope of delivery of load handling equipment.

The information and scope must correspond to the current status of the load handling equipment. Proof of the quality of the components and materials that are used as well as the tests that are carried out must be included.

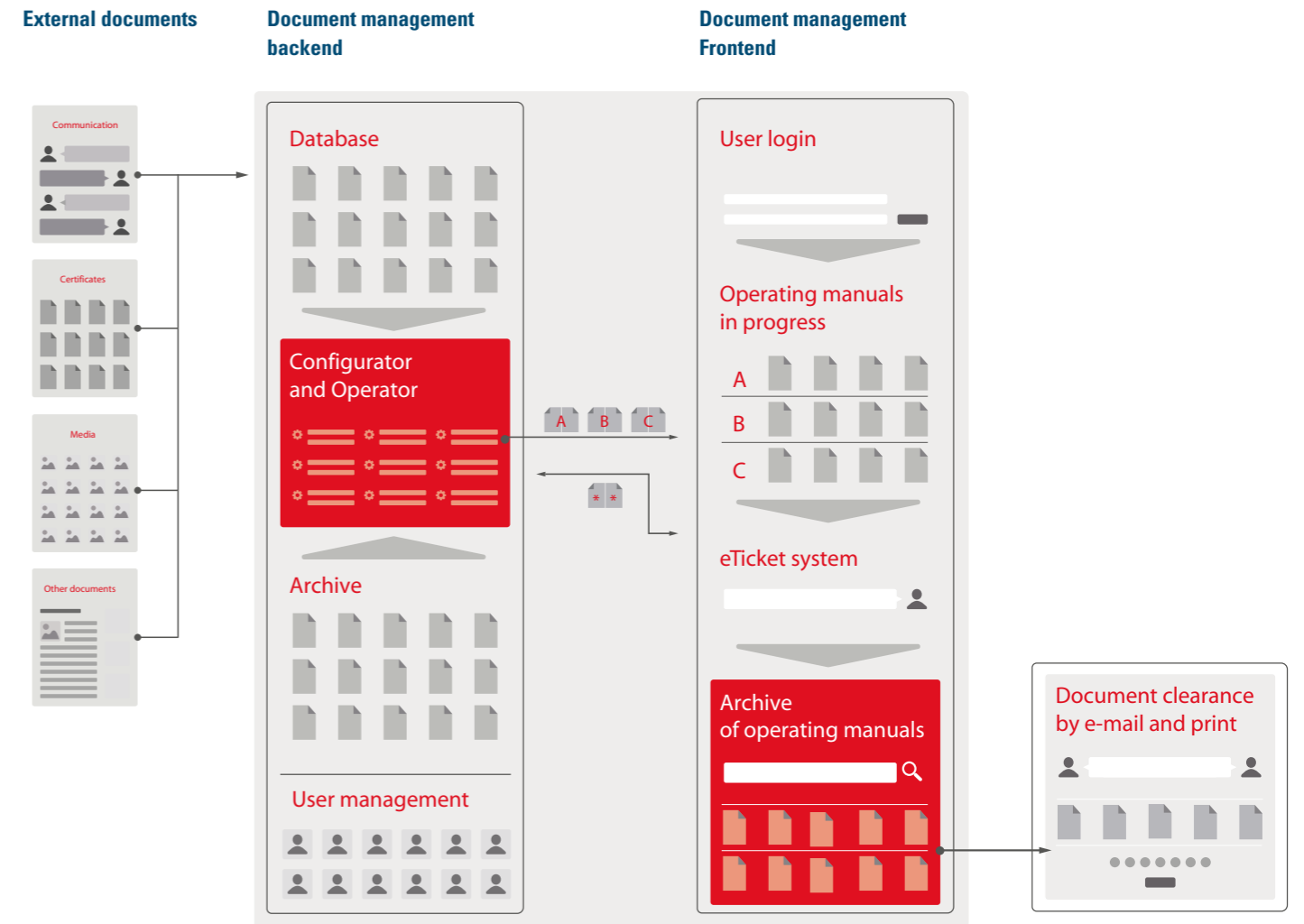
In the case of simple standard solutions, a ready-made template can be used. Complex solutions require an adapted instruction manual. For this, documents from the various sources must be compiled. The contents are „manually“ „laid out“ like print documents. The correction workflow takes place via many channels, such as e-mail, telephone, etc., and is therefore tedious and time-consuming.

With Axzion Document Management, documentation is generated, managed and archived semi-automatically and the workflow between customer and manufacturer is organised. Content is prepared as an editorial part separately from the design and is only merged into a PDF with the export. The documents that are produced in this way are archived within the system and can be viewed and sent from there.

Advantages of document management:

- No more layouting is necessary: Uniform standard and greatly reduced working time
- High document quality due to pre-standardised document structure and recurring content
- Customer-specific layout is possible (documents which are analogous to quality management and/or corporate design)
- Documents comply with the current legal standard (AXZION documentation is DEKRA-compliant)
- Archive of all project-related data with revision
- Users are automatically informed about status changes to the document
- In-house ticket system organises the correction process for each document
- Documents can be sent from the system via a link
- Print service: Documents can be ordered from the system as booklets (automated print and logistics order without manual intervention)

Partially automated document management with a ticket system and sharing interface



Q7

SERVICE



Maintenance, repairs and operation

Tests based on accident prevention

According to accident prevention regulations, load handling equipment must be checked at certain intervals to ensure that it is in a safe condition.

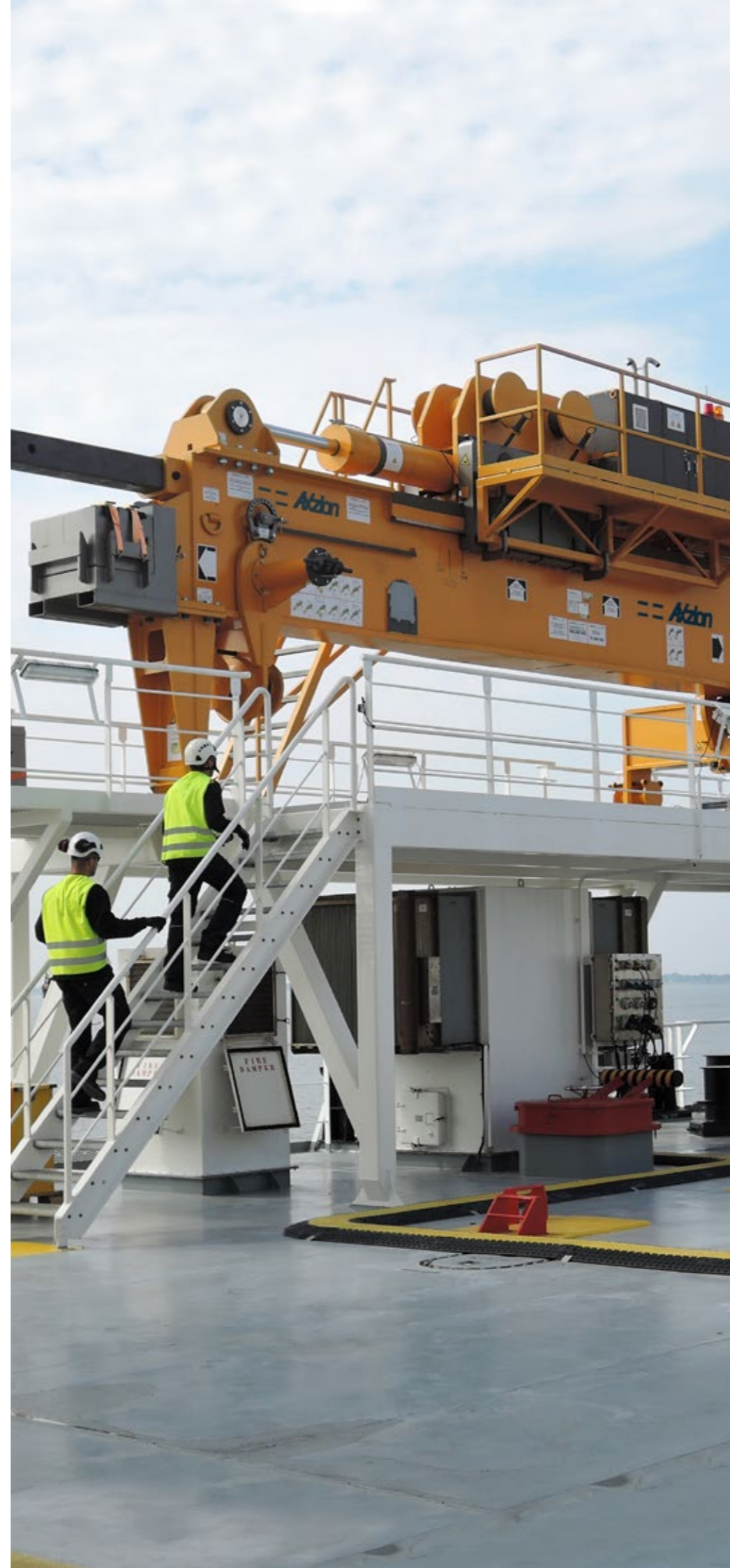
In our service department we employ highly qualified crane experts, welding specialists, electrical engineers and hydraulic specialists.

These employees have the necessary qualifications and assume responsibility for compliance with the statutory regulations.

Repairs and maintenance

We carry out regular maintenance work on site. In doing so, our service staff have several qualifications. Faults are quickly detected and rectified directly.

If a component is not in stock, we are able to manufacture replacements at short notice thanks to our efficient production facilities.



Expertise in accordance with the employers' liability insurance association

Hoistable personnel lifting equipment	DGUV rule 101-005
Hydraulic line technology	DGUV rule 113-015
Ladders and steps	DGUV information 208-016
Personal protective equipment against falls from a height	DGUV basic principle 312-906
Electrical equipment and installations	DGUV regulation 3
Lifting and load suspension devices	DGUV rule 100-500
Cranes	DGUV regulation 52
Winches, lifting and pulling equipment	DGUV regulation 54
Shelves	DGUV Information 208043
Torque tools	DIN EN ISO 6789
Power operated doors and gates	ASR A1.7

Expert knowledge

Load control	VDI 2700a
Crack-free testing	MT 1+2
Crack-free testing	PT 1+2
SCC document 017	SCC for operational managers

Offshore suitability in accordance with GWO

First Aid	
Fire Awareness	
Sea Survival	
Helicopter Underwater Escape Training incl. CA EBS	
Working at heights	
Manual handling	

Training and operation

Our lifting specialists pass on their knowledge to ensure the smooth operation of your load handling equipment and the lifting procedures involved. Practical seminars and workshops contribute to this just as much as personal training directly on site.

Sometimes, the lifting processes are particularly critical. In this case, our lifting specialists can take over the operation of the load handling equipment for you.



24/7 service

Minimising downtime during operation is an important task of project management. Our highly qualified service team is available to customers within the service contract around the clock, including weekends and public holidays.

The employees have offshore training and can also be flown to remote locations by helicopter.

Spare parts can be stored by arrangement at our service location in Großefehn and in the future, also in Denmark.

Remote maintenance

Remote maintenance enables the service team to call up the status of the load handling equipment at any time. This enables the control system to be diagnosed and corrective measures to be initiated. Remote maintenance optimises site times and significantly minimises crane downtime.

A global service for the load handling equipment is provided in combination with the optional 24/7 service contract.

Maintenance, repairs and operation

Risk analysis and hazard assessment

Under point 1 of Annex I, the Machinery Directive 2006/42/EC states: “The manufacturer of machinery or his authorised representative must ensure that a risk assessment is carried out in order to determine the health and safety requirements applicable to the machinery. The machinery must then be designed and constructed taking the results of the risk assessment into account.”

This concerns the manufacturer of machinery falling within the scope of the Directive. This includes load handling equipment.

The manufacturer must carry out a risk assessment in which he identifies all the hazards that may arise during the intended use and foreseeable misuse of his load handling equipment.

In order to avoid possible hazards or to reduce hazardous situations, he has to define measures to prevent or minimise the hazard.

The load handling equipment must then be designed and constructed taking into account the results of the risk assessment and the measures that are described.

The operator of the load handling equipment is obliged to carry out a risk assessment for this. When carrying out the risk assessment, the following points must be observed:

- Interactions with other work equipment occurring during the use of the work equipment.
- Hazards that may occur during the use of the load handling equipment itself.
- Hazards that may occur between the load handling equipment and the working environment.

Furthermore, the operator must determine the tests that are required for work equipment – in particular the type, scope and deadlines.

Furthermore, the employer must determine and specify the necessary requirements which must be met by the persons who are to be entrusted by him with the inspection or testing of work equipment.

The preparation of the risk analysis that is required for the operation of the load handling equipment is sometimes very demanding and also time-consuming.

SpanSet AXZION employs highly qualified lifting specialists for this and can undertake this work in cooperation with the operator.



Handling instructions

For the correct use of load handling equipment, handling instructions are increasingly required in which the lifting process is described comprehensively including the special cases that should also be dealt with.

The preparation of the hazard analysis required for the operation of the load handling equipment is sometimes very demanding and also time-consuming. Because of this, SpanSet AXZION employs highly qualified lifting specialists as well as specialised graphic designers and technical editors and can undertake this work in cooperation with the operator.

For the design,
manufacture and execution
of load suspension devices

Expertise in accordance with the employers' liability insurance association

DIN EN 13155	Cranes – Safety – Loose load handling equipment
DIN EN 1090-1	Steel structures, verification of the conformity procedure for load-bearing components
DIN EN 1090-2	Steel structures, technical rules for execution
DIN EN ISO 5817	Evaluation of welded joints
EN ISO 12944	Corrosion protection of steel structures through the use of coating systems
DIN EN 1993	Eurocode 3 – Measurement, design and execution of steel structures
EN 13001	Cranes – Design / Crane safety
DIN EN 1990	Eurocode: Fundamentals of structural design
DIN EN ISO 3834	Quality requirements for fusion welding
DIN EN ISO 9606	Qualification test of welders - Fusion welding
Maschinenrichtlinie	EC Machinery Directive 2006/42/EC
Regulations of the Employer's Liability Insurance Association	DGUV Rule 100-500 – Operation of work equipment DGUV Rule 109-017 – Betreiben von Lastaufnahmemitteln und Anschlagmitteln DGUV Rule 108-007 – Stability on storage racks
SEW 088	Weldable steels and the processing of low-alloy steels
Ordinance on Industrial Safety and Health (BetrSichV)	Safety and the protection of health when using work equipment



01 Catalogue
SpanSet Height safety



02 Catalogue
SpanSet Lifting



03 Catalogue
SpanSet Load control



04 Catalogue
Safety Management



05 Catalogue
Axzion Lifting



06 Catalogue
Axzion Wind



07 Catalogue
secutex impact protection



08 Brochure
SpanSet Seminars



09 Brochure
SpanSet NoCut

Order now free of charge or
conveniently download online!

Conveniently download the latest catalogues
and brochures as PDF files to your computer and
tablet at www.spanset.de or order your personal
printed copy of the brochures that interest you
free of charge.



SpanSet Axzion GmbH
Headquarters and production site

Winkelsweg 172
40764 Langenfeld
Tel. +49 (0) 2173 20 892-0
e-mail info@axzion.de

Technical sales and design

Borisgstraße 6–8
52531 Übach-Palenberg
Tel. +49 (0) 2173 20 892-0

Neustrelitz production site

Am Bahndamm 9
17235 Neustrelitz
Tel. +49 (0) 3981 2865-0
e-mail info@axzion.de

Großefehn Service point

Schmiedestraße 10
26629 Großefehn
Tel. +49 (0) 2451 484 573 192
e-mail info@axzion.de

SpanSet GmbH & Co. KG

Jülicher Straße 49–51
52531 Übach-Palenberg
Tel. +49 (0) 2451 4831-0
e-mail info@spanset.de



www.axzion.de



www.spanset.de

SpanSet Axzion GmbH – A company of the SpanSet Group

Subject to technical changes. All rights reserved. No part of the catalogue may be reproduced or processed, copied or distributed using electronic systems in any form (print, photocopy, microfilm other process) with the written consent of the company, SpanSet Axzion GmbH. This catalogue has been prepared with due care; SpanSet Axzion GmbH accepts no liability whatsoever for errors or omissions.