



The sky is the limit
Lightweight, stable, weather-proof: Learn how BRECOprotect® timing belts support year-round maintenance of wind power plants.

More on page 1 and 5



Hyperspeed
Thanks to CONTI® SYNCHROCHAIN CARBON heavy-duty timing belts the hyperloop traffic system HyperPodX can reach speeds of up to 500 km/h.

More on page 1 und 2



Hydrolysis protection
No fear of water! BRECOprotect® timing belts offer exceptionally high resistance to water and cleaning fluids in the food and pharmaceuticals industry.

More on page 2 and 3



LIGHTWEIGHT construction with polyurethane timing belts

Photo: WP Systems GmbH

A barely manageable demand for rotor blade repairs is looming on the horizon in the wind power industry. The solution: A mobile service platform of the Brandenburg-based company WP Systems GmbH has doubled the number of possible maintenance assignments per year compared to previous systems. The platform features BRECO® timing belt drives, which play an important part in weight reduction.

We are witnessing a positive trend: With 100 terawatts supplied by onshore wind power plants, this eco-friendly power source was the second most common source in 2018, ahead of even nuclear energy and coal. However, the necessary systems cannot withstand their expected 20 year service life without repairs and service work. It is hard to believe, but the rotor blades made of glass fibre reinforced plastic are particularly affected by

erosion, lightning strikes and tears caused by high fluctuating loads. In Germany, the rotor blades are generally inspected every two years by service technicians using cable systems. "However, repair work on a cable has not stood the test of time and proper laminate repair work is just not really possible when you are working from a cable", explains Ole Renner, one of the two directors of WP Systems, a com-

pany specialising in maintenance of rotor blades and dismantling of wind power plants. He adds: "There is a trend toward mobile service platforms. The state of the art today is represented by open service platforms, i.e. open frame structures which bring to mind mobile scaffolds. Once their frame is stabilised on the tower,

► Continued on Page 5

LOGISTICAL SYSTEM OF THE FUTURE

Heavy-duty timing belt CONTI® SYNCHROCHAIN CARBON drives the hyperloop system HyperPodX

The hyperloop is a high-speed traffic system based on pods moving at close to the speed of sound on an air cushion through a tube maintaining a partial vacuum. Students of the cooperative degree program Engineering Physics of the University of Applied Sciences Emden/Leer and the University of Oldenburg have developed a hyperloop for the development project "HyperPodX", which was organised as a competition by the American company SpaceX. Its drive contains a heavy-duty timing belt CONTI SYNCHROCHAIN CARBON by Continental.

The hyperloop system would permit transport of people and goods at speeds of over 1,000 km/h - speeds comparable to those of aircraft. But the hyperloop system would offer advantages over air transport: The hyperloop is significantly more environment-friendly and could run on the schedule of an underground train. The technological concept is based on using tubes to reduce the resistance experienced by conventional trains in order to achieve far higher vehicle speeds. In particular, the air resistance is reduced to nearly zero. The air pressure within the tubes is at only one percent of



Students of the cooperative degree program Engineering Physics of the University of Applied Sciences Emden/Leer and the University of Oldenburg develop the future of mobility with their HyperPodX.

the usual atmospheric air pressure. Moreover, no friction can be generated by wheels, as the hyperloop does not need them. Instead, the pod-shaped vehicles move by using

magnetic levitation technology or air cushions.

► Continued on Page 2

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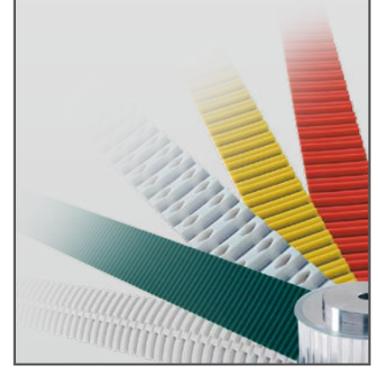
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► Continued from Page 1 LOGISTICAL SYSTEM OF THE FUTURE

Practical hyperloop projects conceivable in the near future

Covering a distance of 1,000 kilometres in just one hour? The idea of using a transport system capable of such feats between production locations worldwide opens up a vast array of new possibilities for the logistics industry. "Another three to five years will pass before the first hyperloop will actually be usable for transporting goods," predicts Prof. Dr. Walter Neu, hyperloop expert at the University of Applied Sciences Emden/Leer. "Various test tracks are currently under construction, for instance in France or in the United Arab Emirates. A track from Vienna to Prague is also under discussion."

If hyperloop technology proves to be feasible in these locations and practical projects can be implemented, companies will not just profit from significantly faster transport of goods compared with current rail or road-based transport. Due to its low friction, the hyperloop requires only a fraction of the energy of conventional transport means, making it both an economical and

a sustainable solution. Moreover, it will reduce the load on roads and rails. In the long term, the hyperloop is also intended for passenger transportation.

Heavy-duty timing belt CONTI® SYNCHROCHAIN CARBON fulfils hyperloop demands

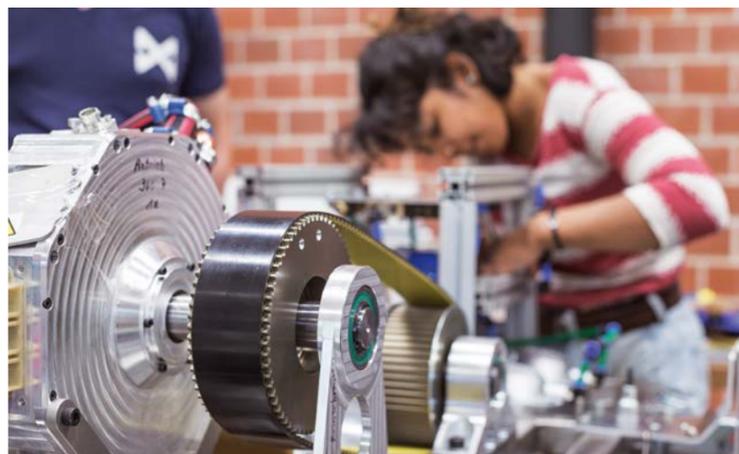
The young talents at the University of Applied Sciences Emden/Leer and the University of Oldenburg under the leadership of Professors Walter Neu and Thomas Schüning researched ways of achieving these high speeds safely and reliably. Their specific task assigned by the SpaceX competition: developing a hyperloop prototype with a drive capable of both powerful acceleration and braking in a vacuum and equipped with its own energy supply. The students conquered this challenge with a 170 kW electric motor.

It is capable of accelerating the 250 kg prototype to peak speeds of up to 500 km/h.

The drive required a high torque and an incredibly powerful belt.

This made it the perfect task for the timing belt CONTI SYNCHROCHAIN CARBON produced by Continental, which was developed for extreme demands. Its material properties allow it to reliably cope with the high acceleration forces of the hyperloop and use in a vacuum. "The carbon cord and polyurethane design makes this belt extremely energy-efficient, while allowing a very narrow and therefore very lightweight design. Moreover, it is highly reliable even without maintenance. These are precisely the aspects - power, reliability and low weight - that the hyperpod demands. So we were able to offer the students the perfect solution," says Alexander Behmann, applications engineer at Continental.

The belt has already passed the first practical test: The test runs on the SpaceX tracks in Los Angeles were successful, putting the team of machine engineering and electrical engineering students of the University of Applied Sciences Emden/Leer among the top 10 ranks of the competition.



High-performance timing belt CONTI® SYNCHROCHAIN CARBON driving the HyperPodX.

Applications engineer Alexander Behmann, Continental, provides the students with hands-on support with their timing belt drive design.



Photos: Continental

This report was included courtesy of Continental. Continental is a founding member of Mulco-Europe EWIV.



Photo: MINKUSIMAGES

Coffee enthusiasts know that all too well: Coffee beans and water – just two ingredients, but the list of variables that might affect the result is practically infinite: the bean, the roast, the degree of grinding, the water pressure, the brewing temperature, etc. – every little detail matters. PU timing belts are just the same ...

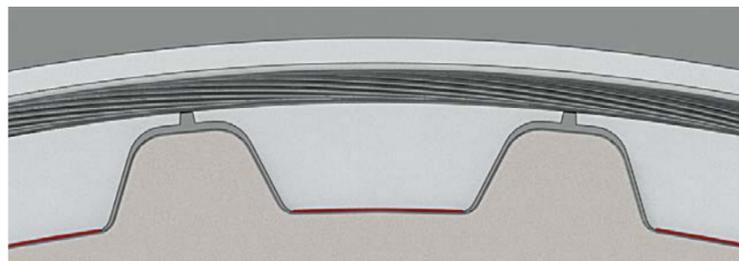
They also consist of "just" two components: The tension member and polyurethane. In this issue of mulco innovativ, we would like to show you how BRECO responds to current trends in drive technology and automation by offering suitable solutions with exceptional "ingredients".

The timing belt for contact with food: BRECOprotect®

Hygienic design is key for production lines in the food industry. Machine lines need to be smooth, with few grooves, undercuts and counterbores. That makes cleaning easier and prevents dirt from accumulating. Stainless steel is often the material of choice to prevent pressure washers, water and chemicals from causing corrosion damage. But how compatible are timing belts with these ambient conditions? Some modifications are required to make them suitable for the food industry. This is because timing belts have "coiling noses". These are small notches at the

tooth root surface where the tension member is uncovered. In this area there is a risk of the steel tension member corroding due to contact with cleaning agents and water. A stainless steel tension member is an easy way to solve this problem, but is slightly more expensive. BRECO offers an interesting alternative: The Porta Westfalica based experts have modified their extrusion process for the "protect" timing belt so that the tension member at the tooth root surface is completely enclosed, eliminating the coiling nose.

► Continued on Page 3



Top: The narrow coiling nose of a conventional timing belt is visible at the tooth root surface. Bottom: BRECOprotect® timing belt completely without coiling nose

Pictures: BRECO Antriebstechnik

► Continued from Page 2 Is is *the details* that truly matter

These belts are no different from other BRECO timing belts where exterior geometry or precision is concerned. The design of these timing belts without a coiling nose also prevents the build-up of concealed and difficult-to-remove deposits and facilitates the cleaning process. Problem solved - but not entirely!

While the steel tension members of endless joined BRECOprotect timing belts are completely enclosed, the ends of the open length version are not covered. But BRECO developers have found a solution for this problem, too: End seals made of transparent polyurethane cover the belt ends. The steel tension member is now completely enclosed in PU. Problem solved!

and humid conditions. Conventional polyurethane timing belts often have a very limited service life under these conditions, particularly due to hydrolysis. For the "protect" timing belts, BRECO uses the specially adapted polyurethane TPUAU1. As an option, it is also available in different degrees of hardness (TPUAU2 and TPUAU3). All of these materials are characterised by excellent resistance to cleaning fluids and water. (A fascinating application example in the field of wind energy proves this resistance to moisture on page 1 and 5 of this mulco innovativ.)

Legal requirements and declarations of conformity

Legal requirements are the final hurdle for using timing belts in

substances. A declaration of conformity of this type is available for all BRECOprotect timing belts.

For export of machines and machine lines to the American market, the polyurethane materials TPUAU1-3 meet the requirements of FDA CFR § 177.1680 issued by the FDA (Food and Drug Administration) for contact of timing belts with dry foodstuffs. The corresponding material data sheet confirms conformity with FDA regulations.

A declaration of conformity for products coming into direct contact with food is also required more and more frequently. That means it is no longer sufficient to declare the compliance of the materials in use with the above directives. It is now necessary to test the overall material compound of the product for suitability for direct contact with food. These "migration tests" were successfully completed for the BRECOprotect product range and the results are confirmed by a certificate. Compliance with the GMP Directive (EC) 2023/2006 (Good Manufacturing Practice) is also necessary to receive this certificate. Only this guarantees the cleanliness or purity of the product following the manufacturing process.

The unyielding: BRECOmove® and BRECOFLEXmove®

BRECO has developed the timing belts of the "move" family especially for high-performance drives and linear drives with high positioning accuracy and strong dynamic characteristics. But how does a high-performance timing belt differ from a standard timing belt? Initially you might assume that it's the tensile strength or breaking

strength. But far from it. A thought experiment will illustrate the situation: If the load on a timing belt increases, the permissible tensile elongation for a perfect tooth mesh with the belt pulley is reached before the permissible tensile force. For this reason, the crucial factor for the performance of a timing belt is its tensile stiffness. BRECO engineers have therefore developed a new steel cord tension member whose belt stiffness is approximately 70 % higher than that of its predecessor. This, in turn, permits greater tensile forces and a higher power density. Due to the higher forces that BRECOmove and BRECOFLEXmove timing belts can transmit, the load on the tooth face and tooth root surface also increased. For this reason, the Finite Element Method (FEM) was used to optimise the surface pressure distribution on the tooth. In addition, a friction-optimised laminate coating has been applied to the tooth side. Both measures reduce the peak loads and the work of friction between the timing belt and the belt pulley by as much as 25 %.

Despite the higher tensile stiffness, the new steel cord also offers greater flexibility, so that smaller minimum diameters with and without contraflexure are possible.

The eco-friendly: BRECOgreen and BRECOFLEXgreen

Climate and environment protection have become a matter of survival for humanity in the 21st century. But what can we do as a company? BRECO are dedicated to optimising their energy consumption, modernising their produc-



You can download both declarations of conformity and the material data sheet as PDF files from our website www.breco.de or request them from the Mulco sales partner for your area.

tion facilities and using renewable resources. But don't products made of renewable resources have functional disadvantages? Dr. Jürgen Vollbarth, Head of Sales and Product Development at BRECO explains: "Our "green" product family proves that protecting the environment and performance do not have to be in opposition. The polyurethane we use for these timing belts is made of up to 37 % renewable resources. These resources, incidentally, are not taken from the food chain. We make a point of that. The majority of them replaces the resource-critical mineral oil component." Even with this high renewable material content, the strength and resilience of the "green" material matches that of a comparable, mineral oil based thermoplastic polyurethane.

BRECO's "green" timing belts are perfect as an absolutely equivalent, eco-friendly product for all companies who have made sustainability part of their profile.

Photo: BRECO Antriebstechnik



Covered face side of a BRECOprotect® timing belt.

Polyurethane for the food and pharmaceutical industry

In the food industry, timing belts need to be particularly resistant to cleaning fluids and water. Water, often from heated pressure jet equipment, is used to rinse the belt after the actual cleaning process. Many synthetic materials are "sensitive" to long-term exposure to warm

the food industry. In Europe, these are the directives of the European Commission, for instance (EU) 1935/2004, (EU) 2024/2006 and (EU) 10/2011. These directives govern the declaration of products along the entire production and delivery chain including traceability, ensuring "good manufacturing practices" and the banning or permissible limits of specific



Photo: BRECO Antriebstechnik

BRECOprotect®

- Timing belt body made of TPUAU1, suitable for contact with cleaning agents, water and dry foodstuffs
- Tension member completely enclosed by polyurethane
- Pitches T10 PRO, AT10 PRO and AT15 PRO

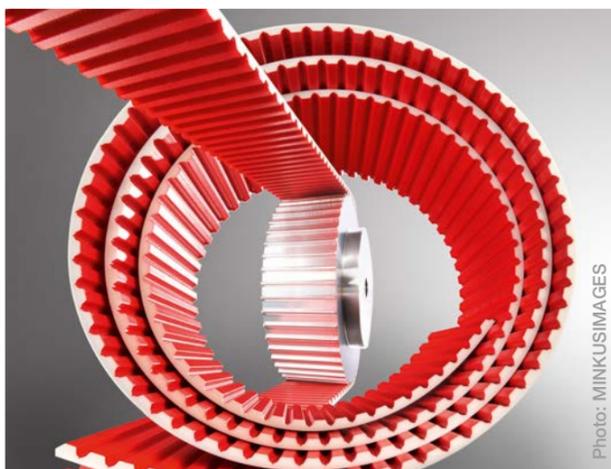


Photo: MINKUSIMAGES

BRECOmove® and BRECOFLEXmove®

- A newly developed tension member for transmitting stronger forces
- Friction minimisation through laminate coating
- Space-saving thanks to the option of narrower belt widths and smaller pulleys
- Pitches AT10 and AT15, in widths up to 100 mm



Photo: BRECO Antriebstechnik

BRECOgreen and BRECOFLEXgreen

- Eco- and resource-friendly
- 100 % performance on the level of standard BRECO timing belts

SUCCESS IN CIVIL ENGINEERING

with slip liners and timing belts

Sewers and pipes age and wear. After decades they become cracked, start to leak and become penetrated by roots. In 1971, the agricultural engineer Eric Wood had an innovative idea for replacing worn and damaged sewer pipes without having to dig up the roads for every defect: It consisted of a pipe-in-pipe system for rehabilitating sewer pipes without excavation being necessary. However, it took until the 90's before the slip liners reached today's high level of development. How is the plastic slip pipe inserted into the sewer pipe without excavation work, and what role do the polyurethane timing belts play in this process?



Two specialists with insight: Design engineer Timo Singler (on the right) from Brandenburger and engineer René Preßler from Mulco's sales partner, Hilger u. Kern from Mannheim, in front of a restored sample pipe.

Timo Singler, design engineer for winding machines at Brandenburger Liner GmbH & Co. KG in Landau, explains how the slip liner is inserted inside the sewer pipe: „It's similar to putting a model ship inside a bottle. The slip liner is folded because it is ductile, as isn't cured until it is in place. The slip liner – a glass-fibre reinforced plastic fabric pipe impregnated with a liquid thermosetting resin – is inserted into the sewer pipe, inflated with compressed air to fit the pipe and then cured.“ Once the slip liner is inflated with compressed air in the sewer pipe, it takes time to expand to make a close fit with the inside of the pipe. Only then is

the resin cured with UV light. „With a speed of up to 2.0 m/min, it is the most effective method on the market,“ Timo Singler says. Powerful UV lights strung together in several segments serve as a light source. The chain of lights is equipped at the front with a camera for monitoring the process.

Production machines developed in-house

Brandenburger from Landau in the Pfalz developed this curing technology ready for series production in 1993 in cooperation with BASF. In just over 20 years, they produced seven million metres of liners with their patented winding technique. Although the company specialises in composite materials for civil engineering and the pipe-in-pipe system, it also operates its own mechanical engineering department for building special-purpose machines and develops its own production plants in-house.

Brandenburger produces slip liners from DN150 to DN1600 on four winding machine lines and supplies civil engineering companies throughout the world. The new winding machine line shown here covers a diameter range of 800 to 1600 mm. „We produce liners on this machine to lengths over 300 m. This can amount to over 35 tonnes for a delivery with a value of more than 100,000 euros“, the Brandenburger design engineer explains.

The winding machines are also an in-house product

The manufacturing principle of the slip film is always the same: A thin slip film tube is held in shape on the inside by an expandable mandrel – referred to as the „tongue“ – and transported by integrated timing belt drives in the longitudinal direction. A winding form rotates with the resin-impregnated glass-fibre reinforced plastic fabric rolls around the fixed

tongue with the slip film tube until the desired wall thickness is reached. The flat end of the tongue ensures that the slip liner is folded together and can then be wrapped with a protective film and sealed longitudinally.

Mechanical work of art

The dimensions of the new machine lines are formidable. The 2.5 tonne tongue is flanged onto a tubular steel structure with 4 bolts to take the tube film supply. The timing belts are driven via a drive shaft running through the steel structure and a centrally positioned worm gearing. The worm gear drives each of the eight timing belt drives by means of one spur wheel each. The tongue can be precisely adjusted in diameter by means of radially arranged rack and pinion gears until the tube film is tensioned. The deflection rollers are so ingeniously arranged that the wrap-around length for the timing belts always remains constant and the belt drive doesn't have to be readjusted.

The dimensions of the polyurethane timing belts of the type BRECOFLEX BAT are also huge: The endless timing belts have a circumference of more than 10 m. „This is a challenge for the production process and is possible with a special manufacturing process of BRECO Antriebstechnik. The polyurethane is completely extruded around the tension members and then sanded“, engineer René Preßler from Mulco's sales partner, Hilger u. Kern, explains.

Timing belts guide and transport

The drive technology specialist continues: „We normally recommend to our customers not to tension a coated timing belt via the back of the belt. However, as the diameter adjustment of the tongue with its deflection rollers makes this necessary, we recommended precisely adapting the profile of the timing belt backing to that of the deflection rollers.“



Plastic liner pipe with UV lights.

Photo: Brandenburger

BRECO Antriebstechnik manufactured a special sanding disk according to the design of the deflection rollers. The high-quality synthetic rubber, linatrile, is used as a backing. This material is particularly notch ductile. In this context, this describes the resistance of the material against a penetrating object. „It feels similar to a rubber,“ Timo Singler adds.

Self-centring BAT and BATK timing belts

The Brandenburger design engineers chose the BAT timing belt profile with arc-shaped teeth because it is self-centring and can do without flanged pulleys. However, the BAT timing belt has a fixed running direction, i.e. it can completely fulfil its function in only one rotational direction. „To date, all machine lines at Brandenburger have only one preferred direction, including the new machine line up to 1600 mm diameter“, engineer René Preßler explains. However, in trials it was discovered that the large supply of film tube can also be elegantly automatically transported and pushed on with the

tongue in the reverse direction. In the worst case scenario – when the tongue is moved in the reverse direction without film – there was a risk of the timing belt coming off a pulley.

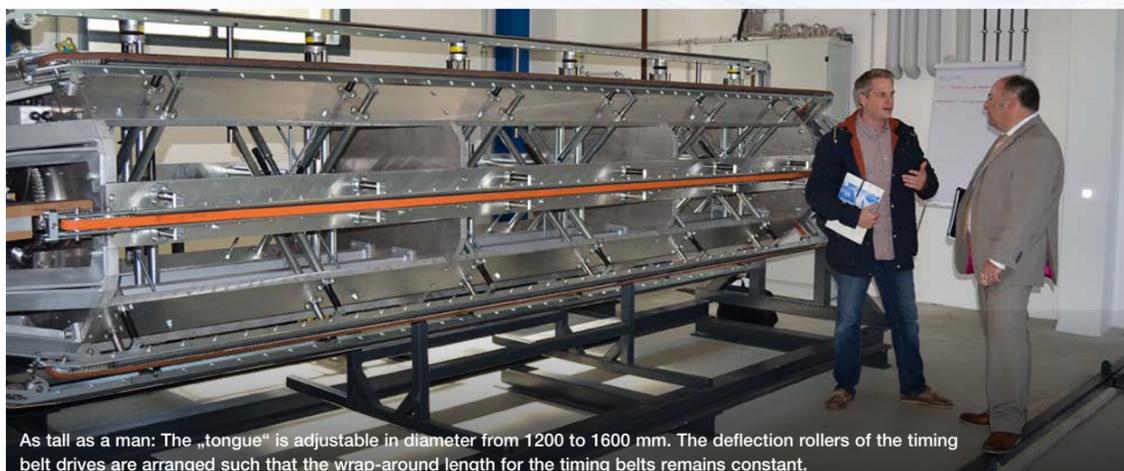
For this, there is the BRECOFLEX BATK polyurethane timing belt with arc-shaped tooth profile and a guide wedge in the centre that runs in the matching groove of the pulley. It is suitable for both rotational directions. However the BATK profile is available only at a width of 32 mm or more. As the new machine at Brandenburger was already equipped with 25 mm wide timing belts, a change to 32 mm timing belts would have led to disproportionately high conversion costs. „René Preßler found an economical, quick and very practical solution for us“, Timo Singler says, and adds: „We use flanged pulleys in the area in which the belt could otherwise drop off. This means that we are replacing only a few pulleys – at a fraction of the cost of changing to 32 mm wide BATK timing belts. For the next revision of the design we will use 32 mm wide BATK.“



Mechanical work of art: The timing belts are driven via a drive shaft and a central worm gear at the front end of the tongue.



Adapted: the resistant linatrile backing is sanded according to the contour of the deflection rollers.



As tall as a man: The „tongue“ is adjustable in diameter from 1200 to 1600 mm. The deflection rollers of the timing belt drives are arranged such that the wrap-around length for the timing belts remains constant.



The 10 m long coated BRECOFLEX® BAT polyurethane timing belts help retain the shape of the film tube and transport them on to the winding station.



On a huge scale: A winding form measuring 4 m in width rotates around the tongue and winds the pre-impregnated glass fibre-reinforced webs around the tube film.

Photos: Krismeyer

► Continued from Page 1 **LIGHTWEIGHT** construction with polyurethane timing belts

they are hoisted up on the rotor using winches. These simple service platforms allow our service technicians to sand the rotor blades, laminate them with polyester resin and seal them with a coating." But a problem remains: Application of laminates and resins is only possible when there is barely any rain and temperatures are no lower than 12 °C. This makes rotor repairs practically impossible in winter and leaves only a few hours a day in the transition periods. It is also impossible to perform repair work in wind speeds of over 12 m/s. Ole Renner explains: "So far, these three factors have limited the possible service days to an average of only 60 to, at most, 100 days per location. That is the result of our statistical analysis of weather data for several wind parks. For the industry, this seasonal business with 30,000 plants in Germany alone is a huge challenge."

Concept for the system terra 1.1

Holger Müller, an expert with years of experience in the field of wind power and director of WP Systems explains the idea of the mobile service platform terra 1.1 like this: "Our approach was to develop a complete system, which would allow year-round rotor blade repairs. That requires not just one but several innovations:

- To provide a dry environment, the service platform must form a water-tight enclosure around the repair area. Moreover, the mechanism must be adaptable to various contours and cross-sections.
- A solution for applying resins at low temperatures must be found.
- The service platform must be transportable with conventional tandem axle trailers. This means that the weight of the trailer and platform is limited to 3.5 tonnes."

With this complicated goal in mind, an interdisciplinary team of machine engineers and experts in materials and lightweight construction as well as simulation specialists founded WP Systems in 2015.

Structural solution for the service platform terra 1.1

Within only a few years, the new team fulfilled all requirements with the terra 1.1 system, including the extremely stringent ones for a certification that includes work at night. The new service platform terra 1.1 is really a mobile workshop. It consists of a lightweight aluminium structure, which can be turned into a wind-proof work chamber using tarpaulins and doors and is equipped with everything that is necessary such as power, light, tools and repair materials.

To close the gap between the rotor blade and the floor or ceiling in a flexible manner, adjustable covers were developed in Ruhland, which are adapted to the aerodynamic contours of the rotor blades. They can be positioned at a distance of only a few centimetres from any rotor blade. A rubber sheet with suction cups seals the remaining gap between the covers and the rotor blades to make it water-tight. This makes it possible to perform repairs even when it is raining. To allow resin to be applied on days with temperatures below 12 °C, the developers at WP Systems use infra-red radiators to heat up the repair area. Within only a few minutes, this method creates temperatures of over 30 °C, even in low ambient temperatures. Moreover, the polyester resin and hardener are stored in a heated transport box to ensure that the temperature chain is never interrupted. With this type of preparation, repair work of any duration is now possible at temperatures as low as 0 °C and even, for brief periods, at temperatures as low as -10 °C.

Timing belt drives for supporting and rotating the work chamber

Moving the chamber along the rotor blade mainly requires three different movements: Height adjustment using cable winches, the movement and support on the tower using the support structure and the rotation of the chamber around its vertical axis, so that it can follow the contours of the rotor blade as closely as possible. The chamber is suspended by rollers from two C-arch sections to permit rotation. The arch sections themselves are screwed to an aluminium hollow section frame. The hollow sections on its long side are guided on a 15.5 metre long support frame.

The greatest challenge: Weight reduction

It was a special development challenge to keep the weight lower than the permissible total weight of the tandem axis trailer of 3.5 tonnes.

Ole Renner describes the conflicts of objectives: "Even though we

made consistent use of the opportunities offered by lightweight construction from the very beginning, we had to come up with something new for the drive of the hollow section frame on the 15 m telescopic frame, so that we could maintain the target weight. Rack and pinion drives made of steel are simply too heavy. A systematic comparison of drive types soon showed us the potential of lightweight timing belt drives.

André Schmidt, sales engineer at the Leipzig location of the Mulco partner Wilhelm Herm. Müller GmbH & Co. KG (WHM) describes the start of the project: "WP Systems' plan was simple yet ingenious: The timing belt is fastened to the end of the support frame and an omega timing belt drive on the bearing frame moves the work chamber to the desired position. However, our first designs were followed by a rude awakening. The calculated tensile force was so high that it clearly exceeded the permissible forces for the support frame - particularly at the top position of the service platform near the rotor shaft - creating a risk of buckling. Higher dimensions for the steel sections were out of the question for weight reasons. We then suggested to WP Systems that the two belt deflection mechanisms of the omega drive should be positioned so closely to the belt pulleys that they would create a positive guide for the timing belt around the pulley. This makes the high tensile force unnecessary for this application." Ole Renner says: "This modification was very important for us and extremely helpful. We were able to maintain the dimensions of the support frame and finally achieve our target weight."

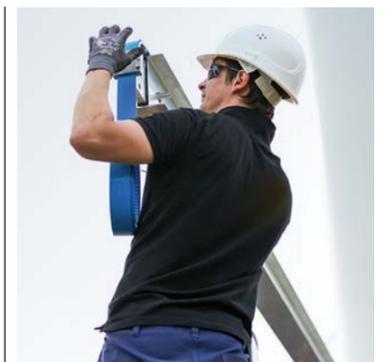
Stable and weather-proof: BRECOprotect®

André Schmidt explains how the most suitable timing belt was selected: "Standard timing belts have coiling noses at the tooth root surface. The steel tension members are unprotected in this area and if the environment is humid, corrosion may occur. BRECO offers stainless steel tension members, but they are not as firm as steel tension members. This means that the stainless



The 15.5 m long telescopic frame consists of several segments to permit transport on a trailer. It's a good thing that the timing belt of the same length is easy to roll up and unroll ...

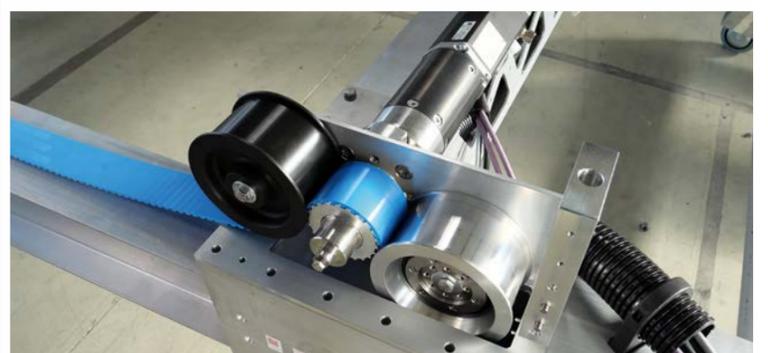
... and install in next to no time with a click-in system.



steel version would have made the drive wider and heavier. For this application, the open-length BRECOprotect belt with fully protected steel tension member was the ideal solution, because, among other reasons, the polyurethane of this belt is particularly resistant to humid environments." (A detailed description of the BRECOprotect can be found in the current edition of mulco innovativ on page 2 and 3.)

WP Systems used the same drive method for rotating the enclosure. In this case, the timing belt is clamped to the inside of the curved C-section and fastened to its ends, with another omega drive between them. André Schmidt explains the added potential of this drive solution: "As this example clearly shows, an omega timing belt drive on a segment of a circle is ideal for implementing rotary, tower and pivot drives for practically any diameter. The drive requires no lubrication and is corrosion-proof."

Ole Renner sums up the past three years of collaboration with the Mulco partner WHM and their practical experience to date: "We are very satisfied with the drive, in particular with the extremely high tensile forces that BRECO timing belts can transmit despite their low weight. That's impressive. Mr. Schmidt and BRECO Antriebstechnik also responded to our many detailed questions during the development phase unexpectedly fast and found answers to all of them. We can now offer the wind power industry a mobile system solution for rotor blade repairs, which can be used on an average of 200 days. That makes it possible to double the repair work performed while maintaining the same personnel cost, thereby easily doubling turnover. BRECO timing belts contributed to this success."



Highly suitable for humid and wet environments and particularly lightweight: Aluminium sections and the BRECOprotect® timing belt. The belt is positioned on the outside above the telescopic frame. The omega drive pulls the hollow section frame back and forth on rollers on the sections of the telescopic frame. The high transmission ratio of the servo gear permits use of a small, lightweight motor with an integrated brake.



Small trick - great effect: Positive guide of the timing belt around the belt pulley.



The tandem axis trailer with the service platform system terra 1.1 of WP Systems in Sweden. The permissible total weight of 3.5 tonnes must not be exceeded despite extensive system technology such as controls, power supply, cable winches, etc.

Photos: WP Systems GmbH

Photos: Krismeyer

MULCO innovativ



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Phone +49 5131 4522-177
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email: info@mulco.de
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Gerschau.Kroth.Werbeagentur
GmbH.
Hohenzollernstraße 5
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