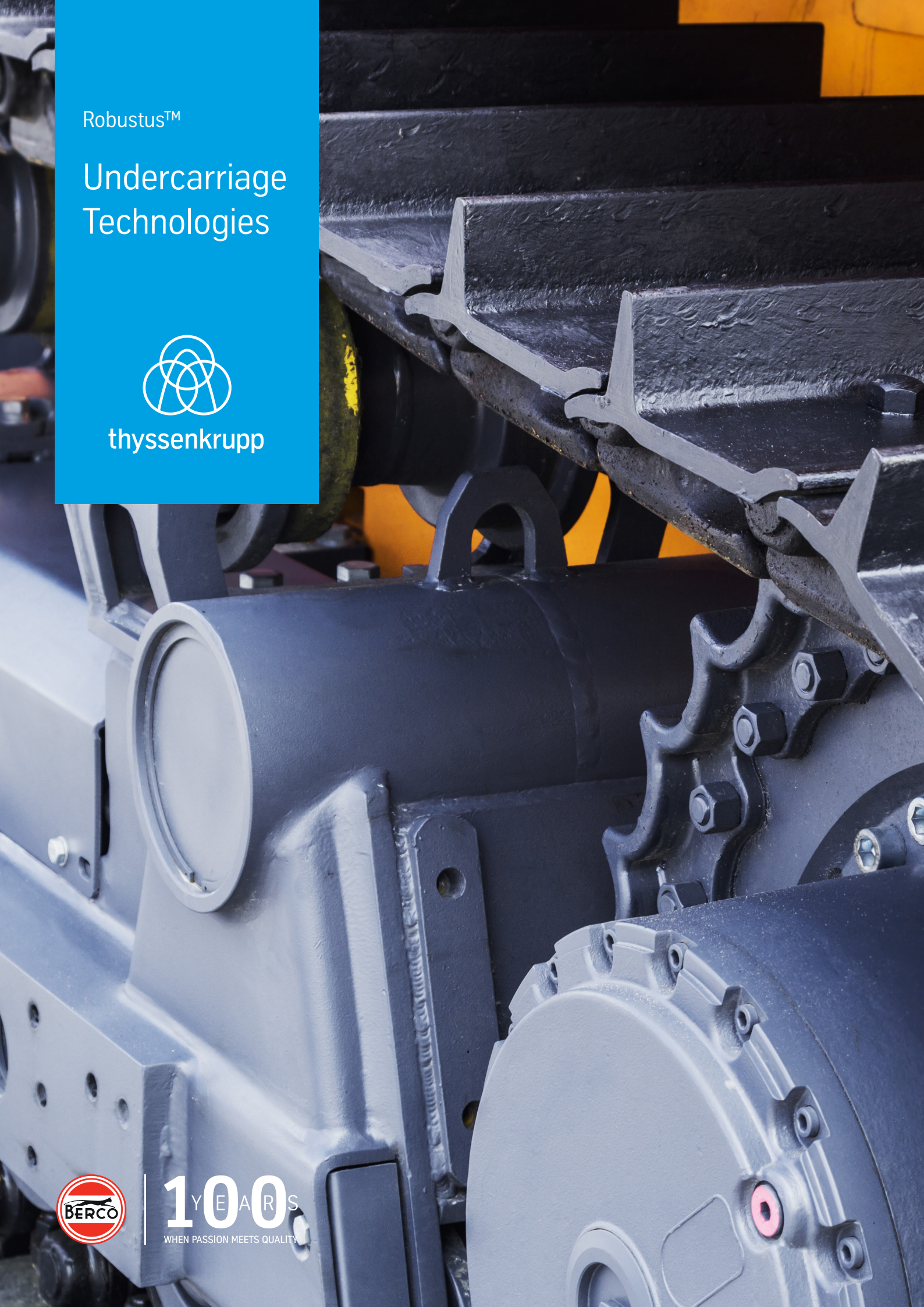
Robustus™

Undercarriage Technologies

thyssenkrupp



BERCO

100 YEARS

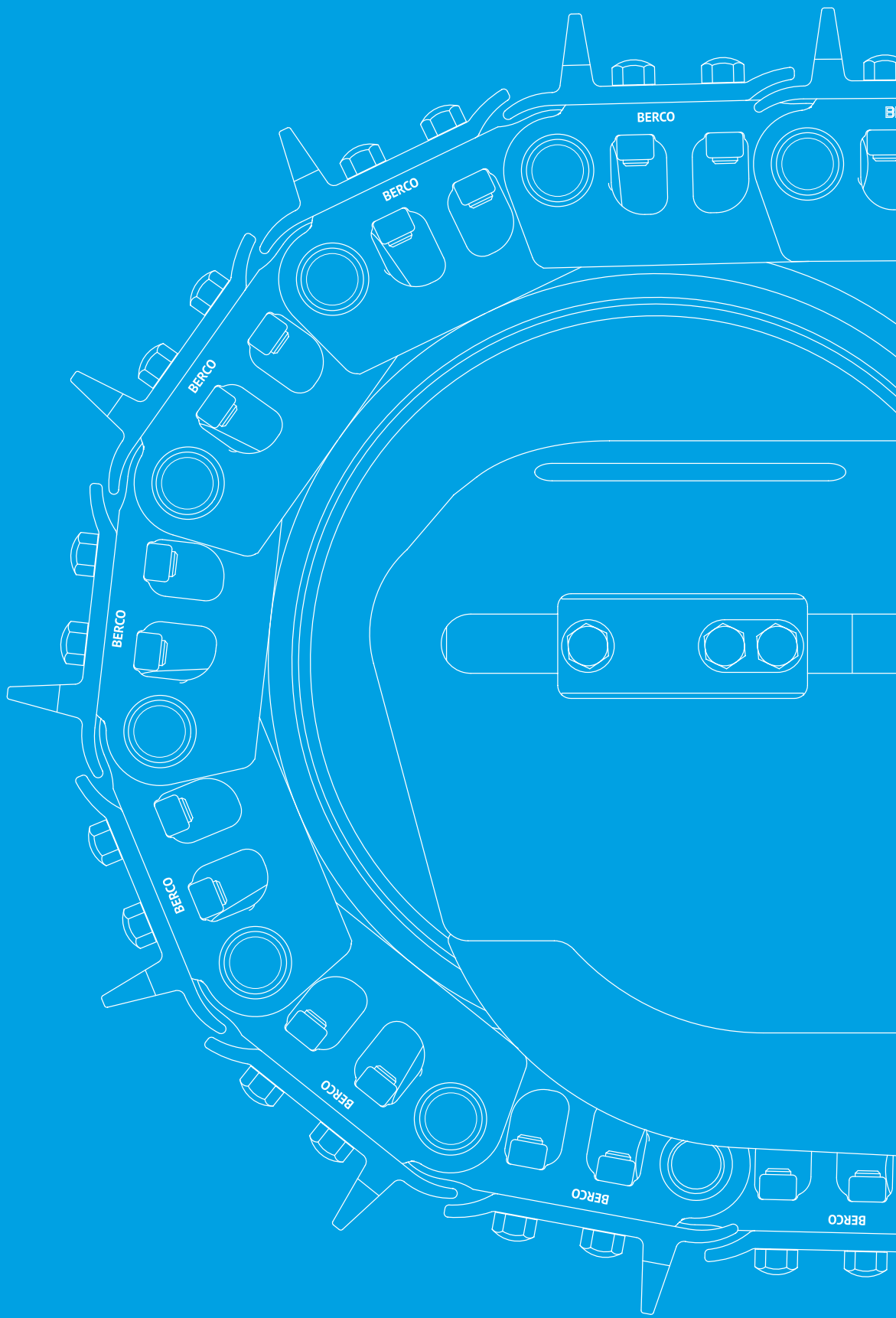
WHEN PASSION MEETS QUALITY

Quality has ancient roots

Our expertise along the entire value chain enables us to provide the best individual solution to our customers. With Berco products, we offer innovative, reliable and economical solutions to any undercarriage need with a wide range of systems and parts for any market. Whether for the Original Equipment Manufacturers or the Aftermarket, from special machines to mini-excavators, from bulldozers to mining excavators, Berco products have the right answer to your specific requirement. Superior engineering, innovative technology, and 100 years of experience with comprehensive know-how and state-of-the-art manufacturing guarantee the total quality of the products and services offered to you.

Custom made solutions and project engineering support is available through our R&D Team, which can help you to choose the most effective and efficient solution to specific undercarriage needs. Berco products add value to your business helping you to reduce development and engineering time, tooling expenses and facility costs. thyssenkrupp is the competent partner for the OEM that wants to take a step beyond. Berco products are made in Italy. Production plants are located in Copparo and Castelfranco Veneto. We also have assembling lines in important markets in the US, India and Brazil. Berco products are present in the world since it is part of thyssenkrupp Forged Technologies Business Unit, a market leader with sales of over €1 billion, 18 locations across eight countries. With 51 forging lines and 157 machining lines, the company has the ability to manufacture components ranging from 50 mm to 6 meters and assemble high-precision parts from 1 kg to up to 6 tons in 69 assembly lines installed in all major regions.

Berco products are developed using 3D design, analyzed with Finite Element Method and realized with rapid prototyping for optimization. Reliability tests on components are carried out to verify life and performance in a variety of field applications. Material and components are analyzed using the best technology to avoid production defects and to verify the performance. Heat treatments are carried out under the continuous control of all parameters of machining by a forefront metallurgy laboratory. The productive process is entirely automated and grants the constant quality of Berco products. Berco products reach more than 70 countries thanks to a global dealer network that delivers all over the world and grants an effective customer care.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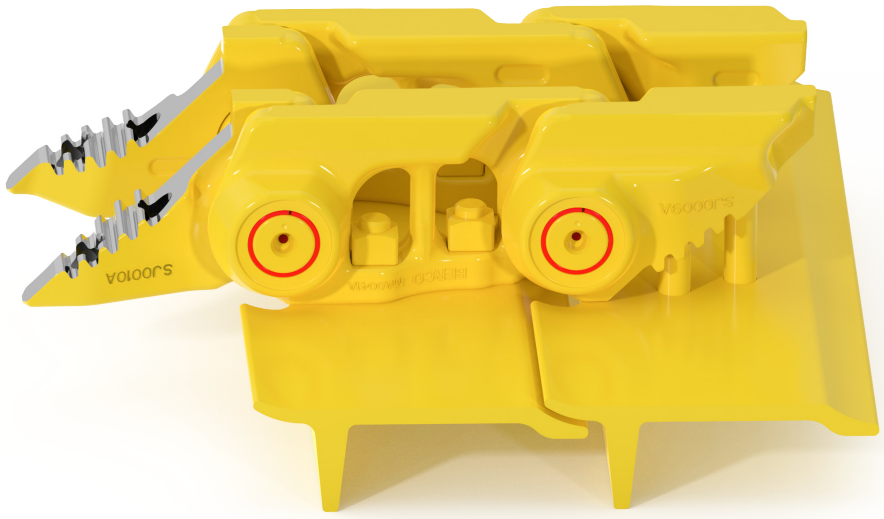
Robustus™ system, now with BPR2

Almost the half of the operative costs in a dozer affects the Undercarriage: friction has a brutal impact on the bushing and the sprocket life cycle. In this kind of applications wear rate is very high and reducing its contribute means reducing costs and increasing operative life.E.g. for the relative movement of the bushing around the sprocket: with the actual solution bushing is slinding over its path on the sprocket, if fully rotation of the bushing around the pin is allowed, sliding become rotation, that means minor friction and consequentially minor wear.

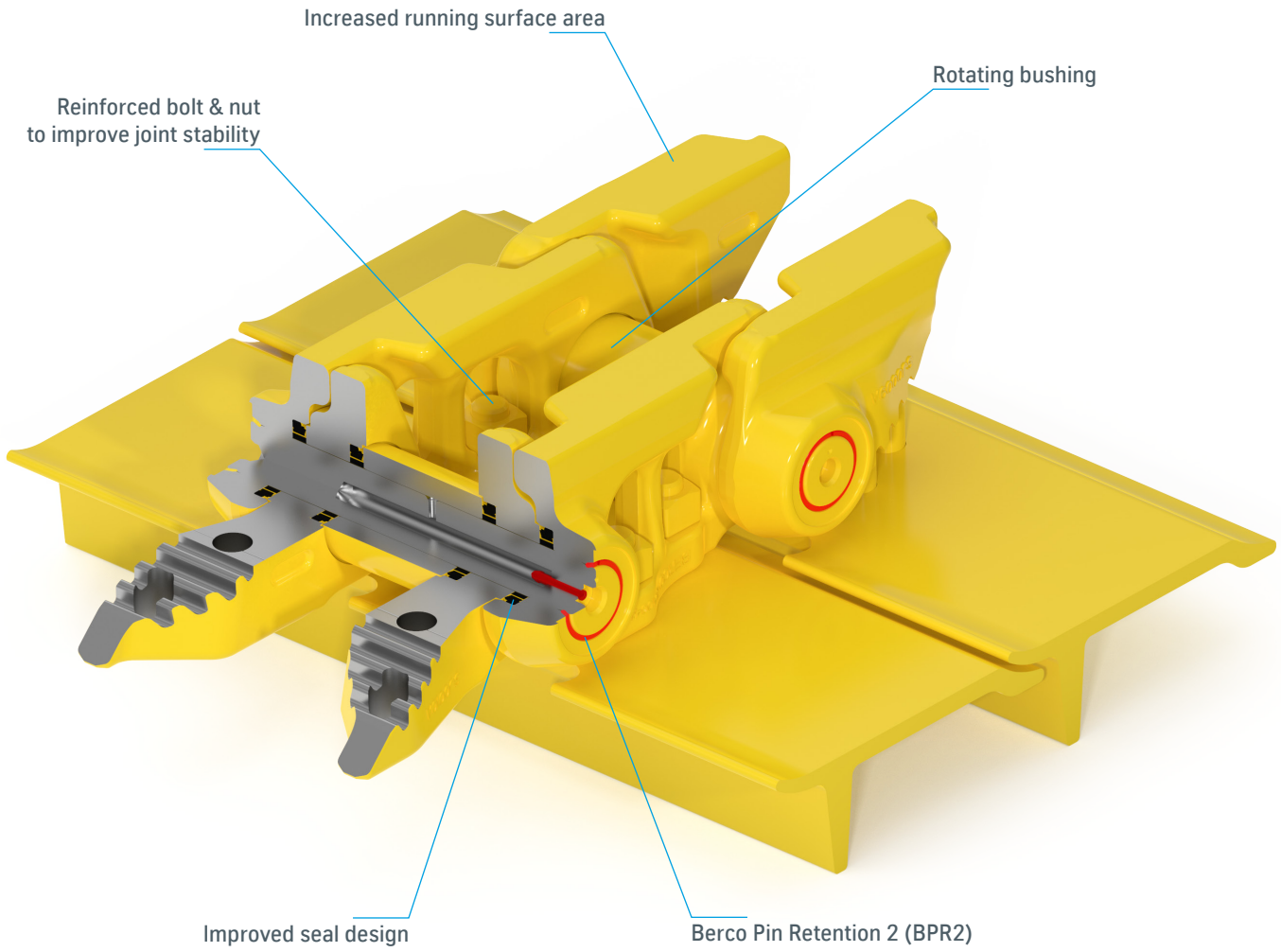
The winning strategy

Increasing the life of undercarriage components is the winning strategy to reduce ownership and operating costs.
In the new system Robustus™ the bushing rotates when in contact with the sprocket, reducing the bushing and sprocket friction and wear and thus enabling longer life.
As a consequence, it is not necessary to turn bushings and pins and replace sprocket segments during the whole life of the undercarriage.
A wider track link rail ("big footprint" track link) provides an extended running surface area, balancing the wear of all components and eliminating scalloping wear in the contact between chain and roller and between chain and idler. The reinforced hardware improves joint stability.
The resulting dampening of vibrations and noise assures more comfortable ride and maximum control of the machine during the operations. New Berco robustus is now at the third generation.
The main innovation has been the introduction of the BPR2 instead of the previous BPR system.
The new Berco Positive Pin Retention system (BPR2) assure longer life to the
complete system. The new introduced feature enable to mantain a more constant a low axial clearance insoide of the joint thus allowing to the chain seal to always work in ideal conditon.
From the new system is expected to have an extended lasting seal capacity of at least 25%.
The new system is fully compatible with existing frames and standard components: (D6H and D5H machines), older machines can be easily upgraded to increase their productivity and the life of the undercarriage.
In the same way Robustus™ is forward-compatible with the new generation undercarriages equipped with parallel or twin links.
The innovative rotating bushing tracks system can be easily installed on any machine at any time. With a simple operation and no extra work you can extend the life of your undercarriage, improving reliability and reducing costs.
Berco field tests proved that the new system increases the track life of 35%, with a maximum of 6,000 hours of operation without maintenance; this means cutting operating costs up to 25%.



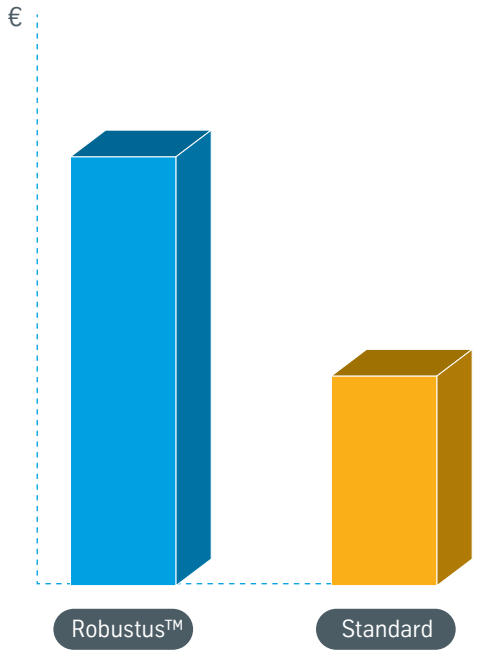
"50% or more of the maintenance costs, during the life of a crawler dozer or loader, belongs to undercarriage maintenance and repairs"

Main features & benefits



- Rotating bushing chain
- Wear perfectly balanced through all components
- New Berco Positive Pin Retention (BPR2)
- Up to 6,000hr with no intervention of maintenance
- Reinforced hardware to improve joint stability
- Completely interchangeable system, using standard sprocket
- Rollers and idlers fit existing frame
- Increased machine resale value
- Less power consumption
- Undercarriage lifetime +35%
- Cost saving of 25%
- New concept of seal design

Robustus™ versus Standard



First fit cost

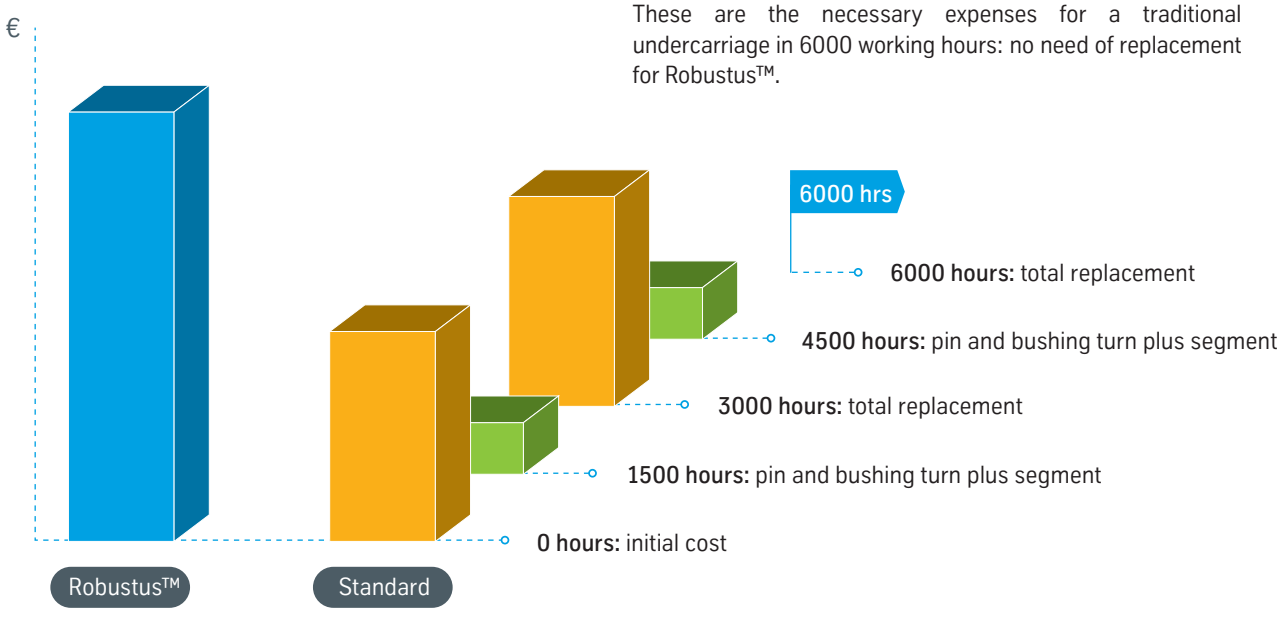
0 working hours

The initial cost for Robustus™ is higher than the one for a traditional undercarriage.

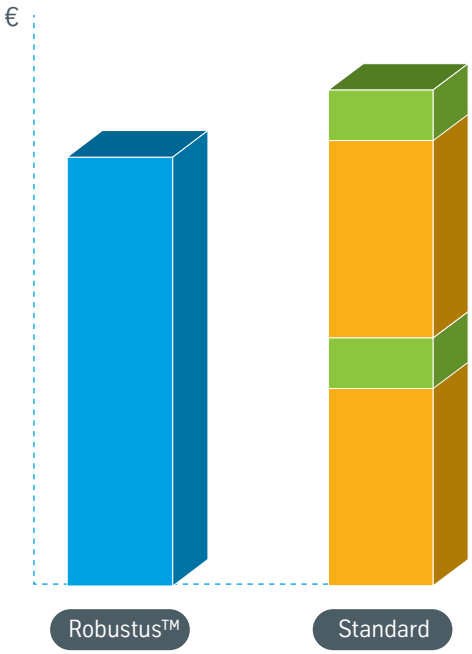
Total cost

6000 working hours

These are the necessary expenses for a traditional undercarriage in 6000 working hours: no need of replacement for Robustus™.



"Increasing the life of undercarriage components is the winning strategy to reduce ownership and operating costs"

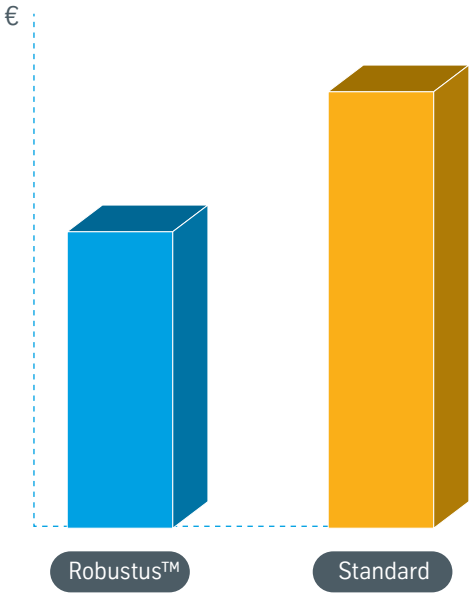


A different prospective for the end user

6000 working hours

Summing up all the necessary expenses for the traditional undercarriage, the situation shown in the first graphic now is completely reversed. The cost of Robustus™ has remained exactly the same, while the traditional undercarriage costs have more than doubled.

- 4500 hours: pin and bushing turn, segment replacement
- 3000 hours: total replacement
- 1500 hours: pin and bushing turn, segment replacement
- 0 hours: initial cost



Cost/hour, considering the undercarriage maintenance: min* -25%

Proven benefits

The data refers to extensive field tests. Berco field tests proved that the new Robustus™ system cuts the operating costs of min. 25%.

*Benefits can be even bigger if considering also machine downtimes and the labour costs.

Components Technology
Forged Technologies

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