

Berco complete Track Systems

The Widest Undercarriage Choice



MOVING YOUR BUSINESS AHEAD

The n. 1 in Undercarriage

6,000,000 Track Shoes
1,300,000 Rollers
180,000 Track Chains
380,000 Idlers and Sprockets
250,000 Tons of product
12,500 Containers of product

4
BTS
COMPLETE
TRACK SYSTEMS



A Company
of ThyssenKrupp
Technologies

BERCO S.p.A.





MOVING YOUR BUSINESS AHEAD

YOUR BEST UNDERCARRIAGE VALUE

Since **1920** Berco has offered an innovative, reliable and economical solution to any undercarriage need. Whether for the **original equipment manufacturers (OEM)** or the **aftermarket**, for a **special machine** or a **mini-excavator**, for a **bulldozer** or a **mining excavator**, Berco can offer you the right answer to your specific requirement.

Superior engineering, innovative technology, comprehensive know how and state-of-the-art manufacturing guarantee the **total quality** of the products and services offered to you.

“Original Equipment Quality, Aftermarket Value”

AN EXPERT PARTNER YOU CAN RELY ON

Custom made solutions and project engineering support is available upon request.

Our team of engineers can help you **choose or design** the most effective and efficient solution to your specific undercarriage need.

They can help you reduce development and engineering time, tooling expenses and facility costs, while **adding value** to your business.

“Berco, The choice of the leading OEMs”

WE CARE

CUSTOMER SERVICE

We have a large dealer network covering more than 90 countries in the world. They have been in business for decades, they know the business and they know it from their customers' point of view. They understand **customers' needs** and they know that their success is tied to their customers' successes.

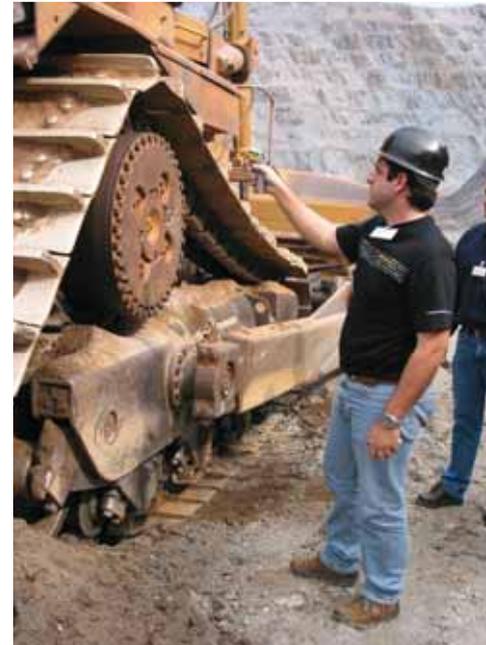
We **support** our dealers with our professional sales force. We train them, and provide them with the right marketing tools and advanced technological systems. We have developed a computer based integrated system **BOPIS** (Berco Online Product Information System) enabling a dealer technician to use a laptop computer from the field to consult our database and easily find the right answer.

We back you, wherever you are. We work with our dealers to establish a parts and service presence near you, in order to always have the right product at the right time in the right place. It is customer satisfaction that has built our **Berco Track Record**.

CUSTOMER SATISFACTION

Considering that more than 50% of your maintenance costs will go into maintaining the undercarriage, it is not surprising that Berco represents the best choice when the time comes for the replacement. And the best choice is confirmed by the large number of **Satisfied Customers** that **Keep Choosing Berco**





LEADERSHIP IN ENVIRONMENTAL DEVELOPMENT

Not only do **we care** about our customers supplying quality products manufactured under **ISO 9001:2000** certified processes, but, also, **we care** about the **Environment**.

Since Jan 2000 Berco is **ISO 14001** certified and has adopted **Environmental Procedures** throughout the entire manufacturing process. We have an **Environmental Strategy** and we continuously check on the progress made toward the set objectives.

Getting More out of Less. Reduction of energy consumption, improved use of materials and minimization of waste, allows for a lower impact on the environment.

We have given preference to environmentally friendly transportation like trains and boats and we have begun redesigning our packaging in order to use recyclable materials. We have changed our painting processes and now use environmentally friendly water-based paint, with a reduction in the amount of pollutant emissions. We have adopted a closed loop cooling system that reuses the water from our heat treatment processes instead of emitting it into the environment.

ISO 9001 - ISO 14001





COMPLETE TRACK SYSTEMS

SYSTEMS TAILORED TO CUSTOMER NEEDS

In order to respond to the growing interest shown by OEMs in “turnkey” solutions, Berco now offers a series of complete undercarriage systems for a wide range of applications, such as pavers, drilling machines, road planers, rice combine harvesters, etc...

This new range of products is confirmation of Berco’s ability to provide integrated solutions, working together with the customer from the initial design stage right through to the supply of the fully assembled undercarriage - the “complete track system” - with undercarriage components, frame, hydraulics and transmission systems, ready for direct installation on the machines on the manufacturer’s assembly line.

Berco is proud of the services it can offer its customers, which include solutions perfectly tailored to customers’ needs and specifications, flexible engineering to achieve the best undercarriage solution quickly and efficiently and comprehensive product support that accompanies customers from the design stage right through to installation in the field.

A SPECIAL PRODUCTION UNIT FOR COMPLETE TRACK SYSTEMS

With this goal in mind Berco has developed a specific production plant to

guarantee the manufacturing capacity necessary to meet customers’ needs - in terms both of quality and quantity. A new Berco division has been organized to engineer, manufacture and assemble a wide variety of different complete track systems: working according to the specifications of both the design department and the customer (co-engineering), the products made by this unit (specialized in the production of track systems complete with undercarriage components, frame, reduction gear, etc...) are superb.

The Complete Track Systems production unit not only specializes in the manufacture and assembly of complete undercarriage systems (for many applications and many machine types and sizes), but is also capable of supplying welded parts for earth moving equipment (i.e. excavator arms and booms, loader arms, drums, etc...).

The new Berco Track System division is capable of providing the customer with a complete manufacturing solution, using the combined resources of its three factories. CNC machining centers (workpieces up to 4 meters long), CNC robotic welding systems, manual welding cells and a wealth of experience in the field are the key factors in ensuring high levels of quality and capability.



COMPLETE TRACK SYSTEM

Designing the right undercarriage solution is a very complex task. A lot of variables and constraints have to be taken into account, especially when the application is not standard and requires ad-hoc solutions and skills.

Being sure to create the cheapest and, at the same time, most reliable undercarriage class for a given application is not as simple as it may appear: track rollers have to be scaled to be strong enough both to withstand concentrated impulsive loads and support the machine in movement; the minimum dynamic performance of the mobile equipment to install has to be defined; the correct stiffness and stroke of the bearing assembly spring has to be calculated accurately. These are just a few examples of the questions that have to be addressed and resolved when designing a complete crawler system. And finding the right answer and, most important, a reliable and optimized engineering solution, isn't always easy.

Berco has been on the undercarriage components and machine tools market since 1920. Thanks to its expertise in the undercarriage field, developed over many years of activity, Berco can offer a vast range of complete solutions for crawler system OEMs in widely differing

industrial areas (e.g. construction, mining, forestry, agriculture, road maintenance, drilling, etc...) and is capable of maximizing performance and optimizing costs and servicing.

Berco has an extensive knowledge of how to produce undercarriage components and is familiar with the way the parts actually perform in the field when the machine is working. As a consequence Berco has decided to apply its know-how to complete track systems that are treated as multi-bodies. Structural simulation is very useful for previewing machine performance in the field. Using test equipment specially designed for undercarriage components, performance results can be obtained for single components (e.g. a track roller test rig that relates machine load, application, speed, oil and lubrication, geometric properties and thermal status). Subsequently, complete multi-body simulation and prototyping make it possible to test the system as a whole after the optimization of all the individual parts.

All the steps in the development, from the initial concept to the realization, are planned together with the OEM customer to be sure that the undercarriage system will be able to

cope with all the technical and operational demands it will be subject to.

All this knowledge, together with the most advanced production facilities and ISO9001:2000 quality standards, make it possible to have a product that everybody can rely on.

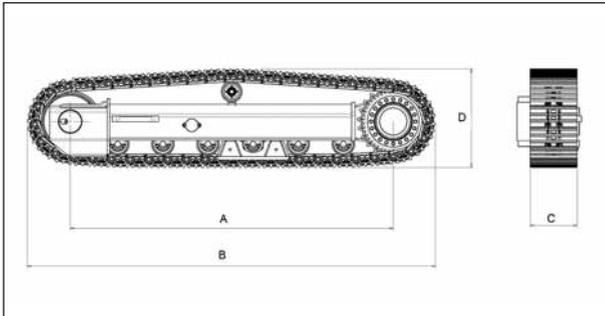
Berco not only develops complete undercarriage systems capable of satisfying all customer needs but also provides support throughout the entire life of the product (from the first idea right through to field assistance) in order to create a mobile equipment unit really tailored to customer requirements.

Berco - the competent partner you can rely on.

We offer a wide range of applications and sizes. On the following pages you will see just a few examples of our products. Custom-oriented design is possible. Our complete undercarriage offer includes frames, track rollers, carrier rollers, track chains, final drive with sprockets, front idlers with track adjusters and shock absorbers. Frames are available both as sideframe only and/or together with carbody. Sideframes can be oscillating or fixed.



GENERIC UNDERCARRIAGE FRAMES



- Standard layout dimensions are presented.
- Custom-tailored design on request.
- Sideframe or carbody supply.
- Wide choice of gear-boxes and hydraulic motors is available.
- Optional swing bearing plate and swivel joints are available.



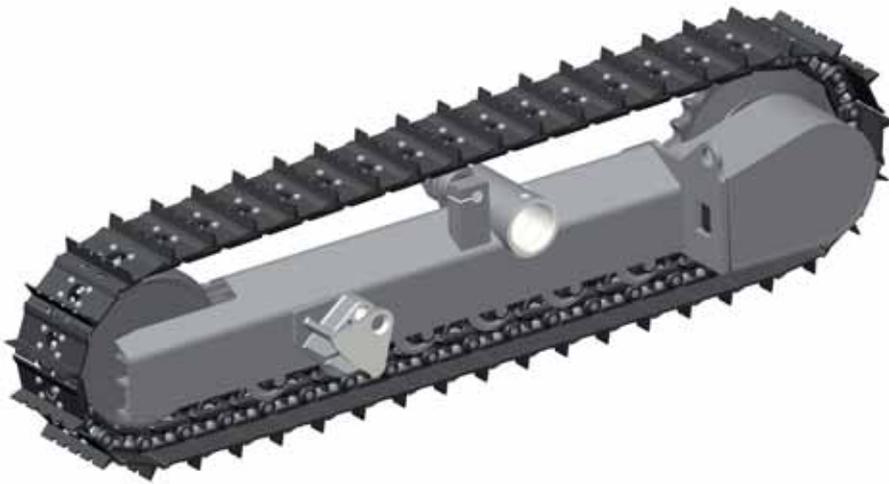
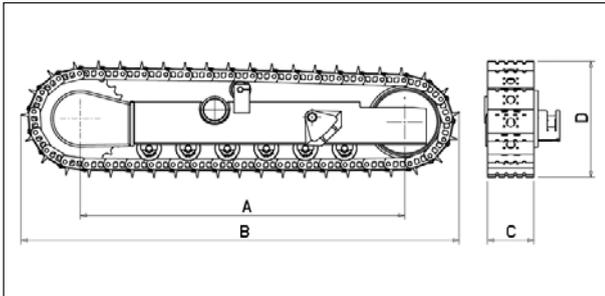
| MAX MACHINE WEIGHT* | | Kg | 4500 | 8000 | 13000 | 16000 | 23000 |
|----------------------|----------|----|---------|---------|---------|---------|---------|
| Carriage pitch | A | mm | 1100 | 2000 | 2800 | 3000 | 3600 |
| Total length | B | mm | 1600 | 2580 | 3540 | 3730 | 4520 |
| Track shoe width** | C | mm | 300/400 | 300/600 | 400/600 | 400/600 | 500/800 |
| Undercarriage height | D | mm | 600 | 700 | 760 | 900 | 950 |

* The max weight is in strict relation with the working application, this example weight is given for an excavator-type of loading

**Various track shoe widths are available.



DRILLING RIG FRAMES

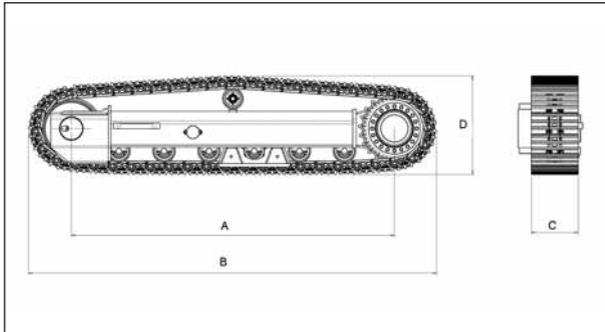


| MAX MACHINE WEIGHT | | Kg | 7000 | 10000 | 13500 | 17000 | 20000 |
|----------------------|----------|----|---------|---------|---------|---------|---------|
| Carriage pitch | A | mm | 1800 | 2100 | 2550 | 2800 | 2900 |
| Total length | B | mm | 2300 | 2800 | 3300 | 3550 | 3650 |
| Track shoe width * | C | mm | min 250 | min 305 | min 305 | min 350 | min 450 |
| Undercarriage height | D | mm | 600 | 780 | 850 | 910 | 870 |

* Various track shoe widths are available.
 Standard layout dimensions are shown. Custom-tailored design on request.
 Wide choice of gear-boxes and hydraulic motors is available.



MOBILE CRUSHING PLANT FRAMES



- Standard layout dimensions are shown. Custom-tailored design on request.
- Wide choice of gear-boxes and hydraulic motors is available



| MAX MACHINE WEIGHT* | | kg | 11000 | | | 15000 | | | 20000 | | |
|----------------------|----------|----|---------|---------|---------|---------|---------|---------|---------|---------|---------|
| Carriage pitch | A | mm | 1520 | 1740 | 1960 | 1810 | 2030 | 2250 | 2195 | 2495 | 2795 |
| Total length | B | mm | 2050 | 2270 | 2490 | 2570 | 2350 | 2790 | 2890 | 3190 | 3490 |
| Track shoe width ** | C | mm | 400/600 | 400/600 | 400/600 | 500/700 | 450/700 | 500/700 | 500/700 | 450/700 | 450/700 |
| Undercarriage height | D | mm | 600 | 600 | 600 | 680 | 680 | 680 | 680 | 680 | 680 |

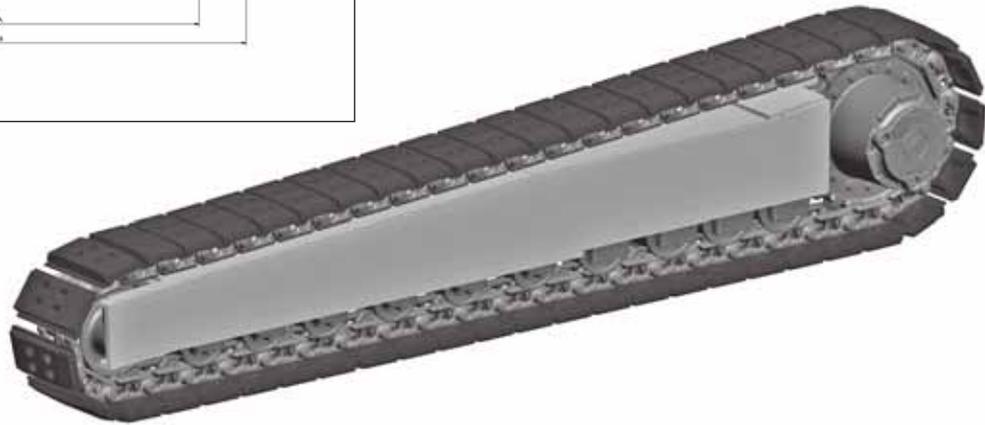
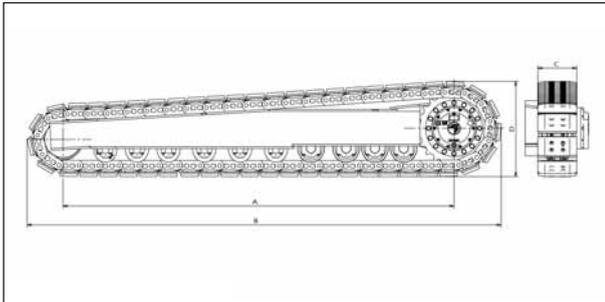
| MAX MACHINE WEIGHT* | | Kg | 25000 | | | 30000 | | | 42000 | | |
|----------------------|----------|----|---------|---------|---------|---------|---------|---------|-------|---------|---------|
| Carriage pitch | A | mm | 2750 | 3134 | 3518 | 3170 | 3440 | 3710 | 2940 | 3260 | 3580 |
| Total length | B | mm | 3470 | 3854 | 4238 | 3960 | 4230 | 4500 | 3750 | 4070 | 4390 |
| Track shoe width ** | C | mm | 500/700 | 500/700 | 500/700 | 450/700 | 450/700 | 450/700 | 800 | 700/800 | 700/800 |
| Undercarriage height | D | mm | 850 | 850 | 850 | 870 | 870 | 870 | 950 | 950 | 950 |

* Max machine weight comprising the weight of material to be processed

** Various track shoe widths are available.



ASPHALT PAVERS



| MAX MACHINE WEIGHT | KG | 6000 | 6000 / 10000 | 10000 / 15000 |
|----------------------|-------------|-------------|--------------|---------------|
| Carriage pitch | A mm | 1850 / 2300 | 2150 / 2650 | 3100 / 3600 |
| Total length | B mm | 1350 / 1800 | 1700 / 2100 | 2100 / 2300 |
| Track shoe width * | C mm | 180 / 330 | 260 / 410 | 300 / 360 |
| Undercarriage height | D mm | 500 | 465 / 550 | 500 |

| MAX MACHINE WEIGHT | KG | 15000 / 22000 | 15000/22000 | 22000 /35000 |
|----------------------|-------------|---------------|-------------|--------------|
| Carriage pitch | A mm | 3150 / 3700 | 3450 / 3650 | 3600 / 3950 |
| Total length | B mm | 2600 / 3100 | 2900 / 3100 | 3000 / 3300 |
| Track shoe width * | C mm | 300 / 457 | 305 / 482< | 300 / 400 |
| Undercarriage height | D mm | 750 | 540 | 750 |

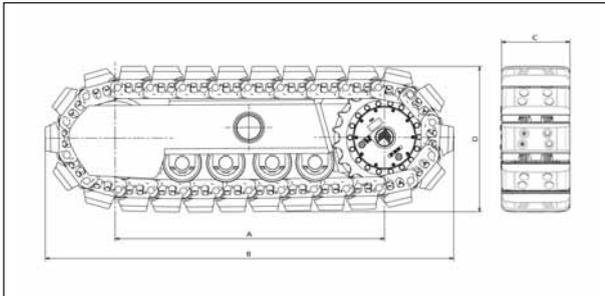
* Various track shoe widths are available. Rubberized shoes or rubber belts. Standard layout dimensions are shown. Custom-tailored design on request. Wide choice of gear-boxes and hydraulic motors is available.

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BTS COMPLETE TRACK SYSTEMS



ROAD MILLING MACHINES

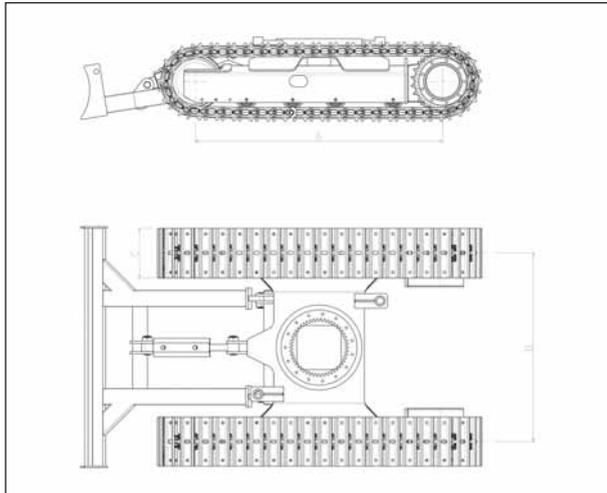


| MAX MACHINE WEIGHT | | Kg | 7000 | 10000 | 13500 | 17000 | 20000 |
|----------------------|----------|----|---------|---------|---------|---------|---------|
| Carriage pitch | A | mm | 1800 | 2100 | 2550 | 2800 | 2900 |
| Total length | B | mm | 2300 | 2800 | 3300 | 3550 | 3650 |
| Track shoe width * | C | mm | min 250 | min 305 | min 305 | min 350 | min 450 |
| Undercarriage height | D | mm | 600 | 780 | 850 | 910 | 870 |

* Various track shoe widths are available.
Standard layout dimensions are shown. Custom-tailored design on request.
Wide choice of gear-boxes and hydraulic motors is available.



MINI EXCAVATORS



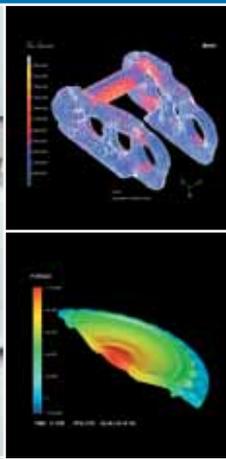
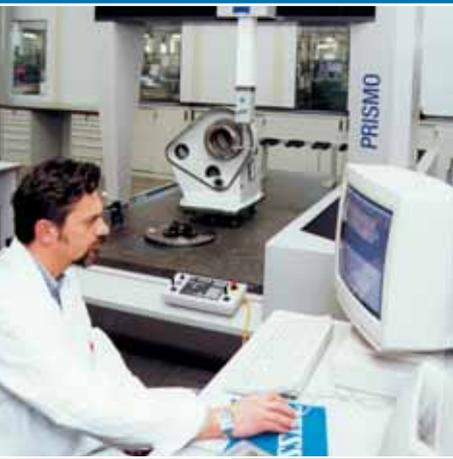
- Mini excavators, utility-use or special application machines.
- Standard layout dimensions are presented.
- Metal track chains with 2-grousers, 3-grousers, rubber pads or rubber belt options.
- Custom-tailored design on request.
- Sideframe only or the whole carbody supply.
- Wide choice of gear-boxes and hydraulic motors is available.
- Optional swing bearing plate and swivel joints are available.



| MAX MACHINE WEIGHT* | Kg | 1500 | 3000 | 5000 |
|---------------------|-------------|------|---------|------|
| Carriage pitch | A mm | 1110 | 1500 | 1925 |
| Total length | B mm | 760 | 1150 | 1450 |
| Track shoe width** | C mm | 230 | 300/350 | 400 |

* The max weight is in strict relation with the working application, this example weight is given for an excavator-type of loading

**Various track shoe widths are available.



MAKING A SUPERIOR PRODUCT

ADDING VALUE TO YOUR BUSINESS

State-of-the-art 3D modeling, **Finite Element Analysis (FEM)** and Rapid Prototyping enables to design, optimize and evaluate a component before it is built.

Artificial Intelligence techniques are currently being developed to automatically inspect 100% of components. **Reliability Test** on components are carried out to determine life and performance in a variety of field applications.

Berco **Metallurgy Laboratory** employs advanced machines such as an electron microscope with microanalysis, a spectrophotometer, tribometers for wear tests, MTS presses for static and fatigue tests (also at **extreme temperatures** $-70^{\circ}\text{C} \div 250^{\circ}\text{C}$) on materials and components.

Huge efforts are also devoted to the development of **New Materials** and improvement of the **Heat Treating Processes**, to guarantee longer product life and **superior products**.

Photo-elasticity and **Strain Gauge** techniques are commonly used for stress and fatigue analysis on individual and assembled components.

Berco adds value not only to the products but also to **Your Business**.



STATE OF THE ART PRODUCTION

With a capacity of over **250,000 tons** of finished product, Berco manufactures more than **180,000 track chains**, **6,000,000 track shoes**, **1,300,000 rollers** and **380,000 idlers** and **sprockets** per year.

Track links are forged, quenched, tempered, machined and induction hardened on the rail surface. Bushings are turned and drilled in double spindle lathes, case hardened, ground and superfinished (lapped) for longer seal life.

Track shoes are either hot rolled or forged for optimum internal grain flow and stronger core resistance, through hardened and stress relieved for perfect geometry and excellent resistance to bending.

Complete track chains are then assembled in a fully automatic transfer line (Berco Design) where all important parameters (torque, lubrication, seals positioning, etc.) are monitored.

Rollers are forged in two halves, welded in automated welding stations, through hardened, machined and finally assembled with shafts, hubs, collars and seal groups.

Sprockets are forged for optimum internal grain flow and stronger core resistance, machined and induction hardened on the entire tooth profile.

Idlers are fabricated by automated welding of hot rolled rail rims (one piece) with heat treated forged hub and high resistance side plates. Painting completes the process while final inspection on the finished products guarantees the **Total Quality** of all components.

AUTOMATED PROCESSES AUTOMATIC QUALITY

The entire production process is fully automated and computer controlled via **Computer Manufacturing Technology** systems. This guarantees a highly reliable process and constant quality of the products.

THE RIGHT PRODUCT AT THE RIGHT TIME

A vast variety of raw materials and **flexible manufacturing** give the competitive advantage of short lead times while matching your specific need. That's what we also call **Customer Satisfaction**.

HEAT TREATED TO TREAT YOU EVEN BETTER

Quality materials and **state-of-the-art manufacturing** are not enough to guarantee the quality of the finished products. That's why the **heat treating processes** are carried out making sure that all process parameters (temperature gradients, time, quenching temperature, etc.) are constantly monitored online.

Hardening and tempering upgrade mechanical properties for superior wear resistance, stress relieving guarantees perfect geometry and excellent resistance for **longer product life**.

INPUT DATA SHEET

In order to design a correct crawler system, we require the following data from you:

PRODUCT REQUESTED:

Machine type / application: _____

Sideframe: YES NO

Complete undercarriage frame: YES NO

GENERAL INPUT DATA

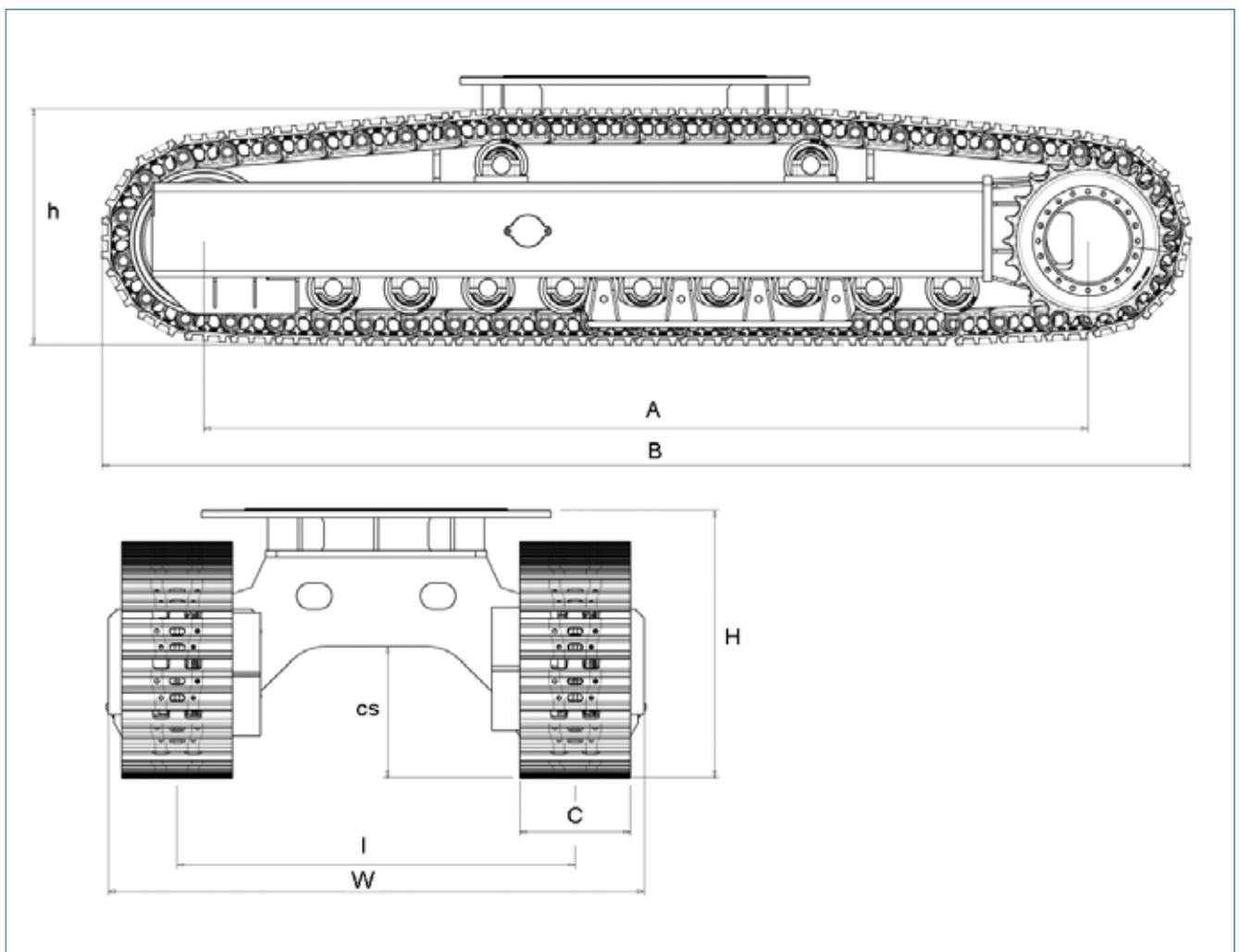
Total machine weight (static / dynamic): _____ Kg

Weight distribution (CG position): _____

Power available for translation per side: _____ kW

Undercarriage size now used: _____

Soil conditions: _____



REQUESTED PERFORMANCE:

Total pull force: F _____ kN

Max vehicle translational speed: v _____ Km/h

Gradeability: G _____ %

Max bending moment: M _____ kN-m

Ground pressure: GP _____ Kg/cm²

Maneuverability special requests, min turning radius: _____ m

REQUESTED DIMENSIONS

Carriage pitch: A _____ mm

Total length: B _____ mm

Track gauge: l _____ mm

Track shoe width, mm: C _____ mm

Total width: W _____ mm

Total carriage height: H _____ mm

Total sideframe height: h _____ mm

Clear span from ground (headroom): cs _____ mm

AVAILABLE POWER PLANT - HYDRAULIC PUMP

Number of pumps: _____ -

Pump displacement: Dp _____ cc

Pump speed: n _____ rpm

Hydraulic system max pressure: ρ_s _____ bar

Working pressure (max differential output): Δp _____ bar

Flow rate per pump: Q _____ l/min

REQUESTED FEATURES:

Oscillating sideframes: YES NO

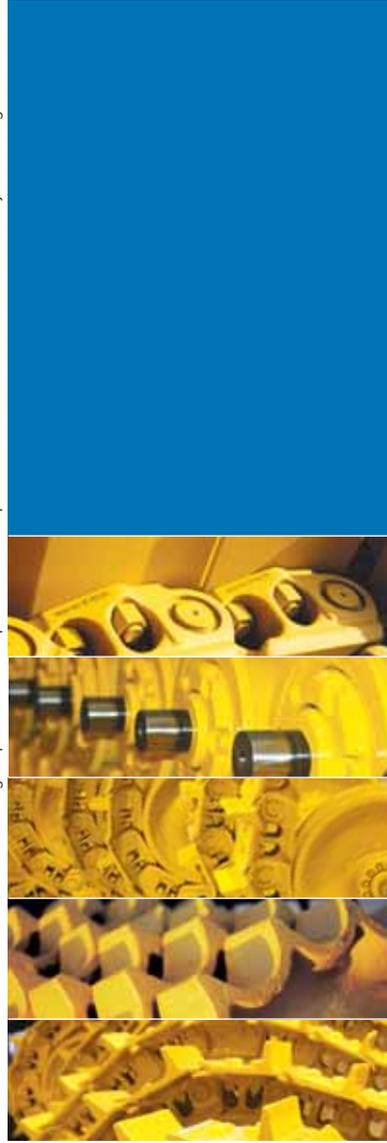
Welded sideframes: YES NO

Bolted sideframes: YES NO

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All manufacturers's names, numbers, symbols and descriptions are used for reference purposes only. All parts listed are of Berco original production. The specifications and processes described in this brochure are subject to change without notice



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