

HARDOX[®]

WEARPARTS



WRC System[®]

**OPTIMISES THE USE OF
HARDOX WEAR PLATE**



A FLUSH SURFACE FOR MINIMAL WEAR

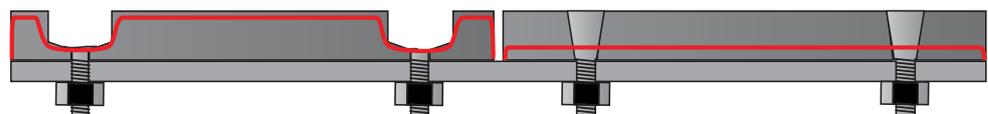
The WRC screw with its conical head creates a smooth, almost homogeneous surface with the wear plate and assures even wear, without the recesses and irregularities which are normally a common source of concentrated wear. The choice of cutting technology and materials prevents the screw from rotating in the hole and simplifies the tightening from the nut side.

The flush surface makes the plate wear more evenly and contributes to greater material utilisation. WRC System® also lowers the risk of wear parts loosening due to worn-out screw heads. In addition, the WRC screw is easy to cut off during plate change-outs, as the surface is most often uncoated.



On the traditional plate, pictured left, crater wear is visible around the screw holes. The Hardox WRC plate to the right is mounted with our WRC screw with a conical head and in this plate it is almost impossible to discern the screws.

Reference facility: Distribution level 833, LKAB, Kiruna, Sweden.



The red lines illustrate the critical wear limit for traditional plate with countersunk screws and for WRC System® respectively. When countersunk screws are used, crater wear often causes screws to wear out before the plate is fully worn. In contrast, the WRC screw, which sits flush with the plate surface, promotes even wear and high material utilisation.



Installation of WRC socket screw.

WRC System®

BACKGROUND

WRC System® (Wear-Resistant Cone System) was born in 2007 from an idea created at LKAB Mekaniska. In subsequent years, product development has been carried out with the help of employees at LKAB who work with industrial wear problems on a daily basis.

WRC System® was introduced at LKAB plants during an extensive and successful testing period in the years 2010-2012. The system is now standard at an increasing number of facilities in the LKAB mines.

In 2014, Hardox Wearparts Centre Perth acquired the exclusive rights to distribute the WRC-System® in Australia.

A SYSTEM WITH MANY BENEFITS

WRC System®, which was developed by LKAB Mekaniska, part of the LKAB Group, offers many benefits. It optimises the use of the Hardox wear plate and contributes to weight and cost reductions. Both our work environment and the external environment benefit from WRC System®.

THREE TYPES OF SCREWS

To broaden the use of WRC System®, three different types of screws have been developed. Each screw has the unique conical shape in either head or socket.



WRC STANDARD

The original WRC screw is designed for tightening from the shell side (nut side).



WRC SOCKET SCREW

The patented socket screw, which consists of a shoulder screw with a detachable conical socket, is the solution when the screw must be tightened from the wear side (screw side).



WRC ROD SCREW

The rod screw with a detachable head is the alternative when extra long screws are needed. The conical screw head with internal thread is used together with a regular threaded rod of desired length. The WRC rod screw is designed for tightening from the shell side (nut side).



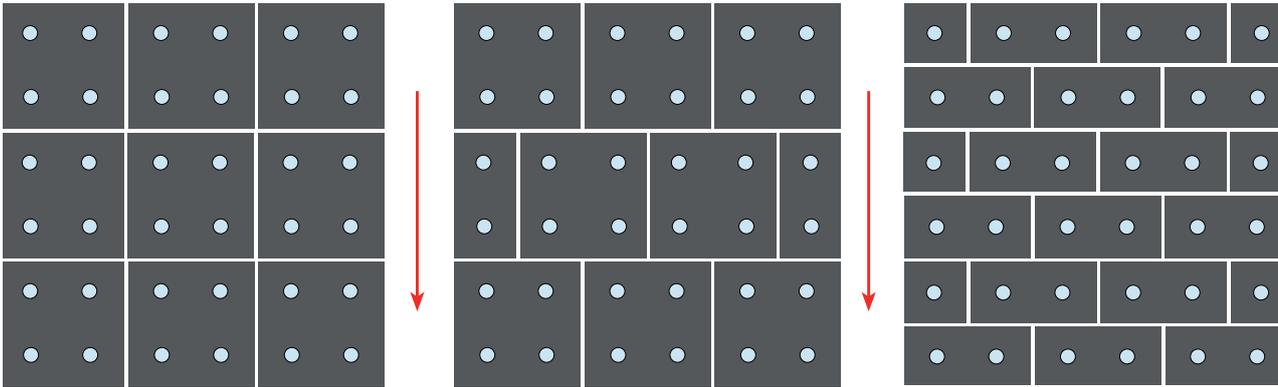
The WRC socket screw is installed from the wear side.

INSTALLATION FROM WEAR SIDE

WRC SOCKET SCREW

For situations where tightening from the screw side (wear side) is necessary we provide a socket screw which consists of a shoulder screw with a detachable conical socket. The patented socket screw enables us to tighten the screw from the wear side and still obtain a flush finish for minimised wear.

The socket screw can be designed for manual cutting or with a break-away head which snaps off when adequate torque is applied.



TRADITIONAL INSTALLATION

A traditional mounting pattern creates long, continuous gaps in the material direction.

OVERLAPPING PATTERN

We recommend using overlapping mounting patterns where possible.

SHORTER GAPS

By using smaller plates and overlapping patterns we achieve very short gaps in the material direction.

HIGHER MATERIAL UTILISATION

THE BENEFITS OF SMALLER PLATES

The Hardox WRC plates are made out of Hardox and cut with abrasive water in a special way - a technology with high precision that allows us to have smaller gaps between the plates. By reducing the size of the gap we are able to provide better protection for the sheet casing which is exposed to direct wear in the gap. We are also able to work with a larger number of smaller and lighter plates. While the running metre of the gap is increased, the gap is made smaller and plates can be mounted in an optimised pattern.

By using smaller and lighter plates we are able to minimise heavy and dangerous lifts. Smaller plates also have the advantage of being easy to change in case of concentrated wear. When large plates are used, the entire plate must often be replaced, even though only a section of the plate is worn (see photo at right).



A large wear plate subjected to concentrated wear forces us to replace more volumes than necessary.



Waterjet cutting is used to cut the Hardox wear plate.

MORE ADVANTAGES

WATERJET CUTTING:

- No thermal influence which lowers the resistance properties of the material
- High precision
- Environmentally friendly

LIGHTER MACHINERY:

- No welding required at plate change-outs
- Easy to replace one or more plates
- Easier plate change-outs allow the use of lighter plates which results in lower tare weights

WATERJET CUTTING

For best results, the Hardox WRC plate is cut with abrasive water, which means that all kinds of steel grades and hardening processes can be used - without thermal influences on the material.

EASIER PLATE CHANGE-OUTS

Hardox WRC plates installed with conical screw heads, and possibly with socket screws for tightening from the wear side, are easier to change than traditional plates.

This is particularly true when Hardox WRC plates replace welded options. Traditional wear plates are often welded to truck beds and buckets, a process which is complex and requires welding skills and specific equipment.

LIGHTER MACHINERY

The Hardox WRC plate is thanks to its smooth surface very durable and yet easy to replace. It is therefore often possible to go down in plate thickness and lower the tare weight of the machinery – measures which contribute positively to both the environment and to productivity. WRC System® is compatible with all types of machinery (e.g. trucks, dumpers, loaders, excavators, etc.) and is currently used on truck beds at the LKAB mine in Kiruna.

A TRUCK WITH HARDOX WRC PLATES

The eight rear plates, which are exposed to the most wear, are smaller than the other plates and easy to replace with a wrench during short downtimes.





OUR VISION

REDUCING WEAR PLATE COSTS

Our vision is that your company will use WRC System® for all Hardox wear plates where possible.

WRC System® offers a highly flexible, high-performance wear plate system with storage and fitting close to your operation. The result is a powerful reduction of your wear plate costs.

The objective when developing WRC System® has been to create a system with a favourable overall economy.

WRC System® enables our customers to select a Hardox wear plate of the right quality for the right facility.

The following benefits are included:

- The choice of optimised steel quality is simplified
- Briefer downtimes
- Lower labour costs
- Unnecessary wear on the facilities is minimised
- Reduced overall consumption of hardened steel
- Fewer breakdowns

BENEFITS AND STANDARDS

PROCESS BENEFITS

- A more even wear pattern reduces the risk of unscheduled downtimes and utilises the steel raw material better
- Smaller plates are easier to change

BENEFITS FOR THE WORKING ENVIRONMENT

- Lighter plates minimise the risk involved in lifting and handling
- Plates can be cut to size on-site with gas

ENVIRONMENTAL BENEFITS

- Higher material utilisation thanks to more even wear and through the use of smaller plates for more exact plate change-outs
- Lower transport volumes of heavy hardened steel thanks to improved material utilisation
- The use of thinner plates, which are easy to replace on mobile units, such as trucks and dumpers, results in lower tare weights and increased payloads
- Plates are cut with energy-efficient waterjet cutting technology

A COMPATIBLE SYSTEM

- Easily adapted to fit the appropriate standard for hole patterns
- Compatible with a wide variety of steel grades and thicknesses

Screw standards

- Plate 6-10 mm M12
- Plate 0-25 mm M16
- Plate 25-100 mm M20

SUPPLIED COMPLETE

WRC System® is supplied complete with the right screws, washers and nuts for your use. First-time assembly is carried out by our WRC certified team or, alternatively, by your own staff under guidance of our WRC supervisor.



Hardox Wearparts is the leading manufacturer of wear parts and wear service in the world. With more than 130 centers, and in more than 40 countries, there is always a Hardox Wearparts Center close to you.

Hardox Wearparts is a part of SSAB, the manufacturer of Hardox wear plates. SSAB is a Nordic and US-based steel company. SSAB offers value added products and services developed in close cooperation with its customers to create a stronger, lighter and more sustainable world.

SSAB has employees in over 50 countries. SSAB has production facilities in Sweden, Finland and the US. SSAB is listed on the NASDAQ OMX Nordic Exchange in Stockholm and had a secondary listing on the NASDAQ OMX in Helsinki. www.ssab.com.

WRC PLATES AND SCREWS SALES

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