PREVENTIVE MAINTENANCE

dMT ECOTECH



PORTFOLIO FOR AS/RS

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Deutsche Gesellschaft Qualitäts-Management ISO 9001 Reg.-Nr. 20210406 Zertifizierung



Why dMT Ecotech®

Sustainable Technical Solutions for AS/RS Stacker Cranes

Reduced Wear

Our coating systems reduce wear in wheel and rail contact pairs.

Less Maintenance

Fewer shutdowns, lower costs and higher system availability in 24/7 operation.

More Sustainability

Longer service lives reduce resource consumption and help protect the environment.

dMT Ecotech® GmbH supports operators of automated storage systems with the preventive maintenance of AS/RS stacker cranes. The focus is on SPC® wear protection for highly frequented contact surfaces such as drive wheels, travel rails, lift rails and guide rollers. These areas directly affect the system availability and material flow of the crane. Continuous protection during operation helps reduce metal abrasion, consequential damage and unplanned downtime at an early stage.

SPC® is complemented by a targeted analysis of the system and any required reconditioning work, such as grinding or repairing damaged rail sections. This creates a coordinated maintenance approach: first assess the condition, then restore critical areas and finally use SPC® to provide lasting preventive protection during operation.

The key benchmark is reliable and economical system operation. dMT Ecotech® therefore takes a holistic view of wear, with SPC® as the central element for longer service life and more predictable maintenance.

Quality Meets 25 Years of Experience

For 25 years, dMT Ecotech® has delivered technical solutions that make systems more reliable. Our SPC® wear protection reduces loads on wheels, rails and guide areas, helping operators prevent unplanned downtime at an early stage.

OUR SERVICES

Independent Quality for Your Systems

Our portfolio includes coordinated solutions for the reliable operation of AS/RS stacker cranes. The components and services presented below work together functionally and address key interfaces between wear, maintenance and operational reliability, with the aim of supporting system availability and cost efficiency across the entire installation.



SPC® Wear Protection

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THE CHALLENGE



How Much Service Life Remains in Your Drive Wheels?

Drive wheels and rails used in intralogistics do not have an unlimited service life. Wear and material fatigue result from load cycles and operation, not simply from time. High wheel loads, continuous operation and geometric deviations lead to increasing wear, particularly on wheel treads and rails.

Did You Know...?

... that the service life of a travel wheel in intensive logistics operation is often only a few years and depends heavily on effective wear management?

This is exactly where SPC® comes in: continuous wear protection at the wheel-rail interface reduces material loss and consequential damage at an early stage. The following figures show how significantly this can affect service life, maintenance effort and system availability.

80%

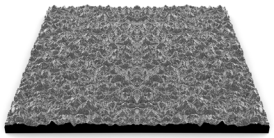
Wear Reduction

Reduces unplanned downtime, lowers maintenance costs and supports reliable budget and maintenance planning during ongoing logistics operations.

3x to 5x

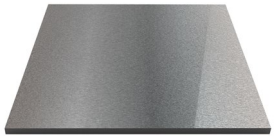
Longer Service Life

Increases system availability, extends rail-reprofiling intervals and sustainably improves the total cost structure over the complete life cycle of AS/RS stacker cranes.



Before

Microscopic contact areas at the wheelrail interface create extremely high contact pressures and lead to material fatigue.



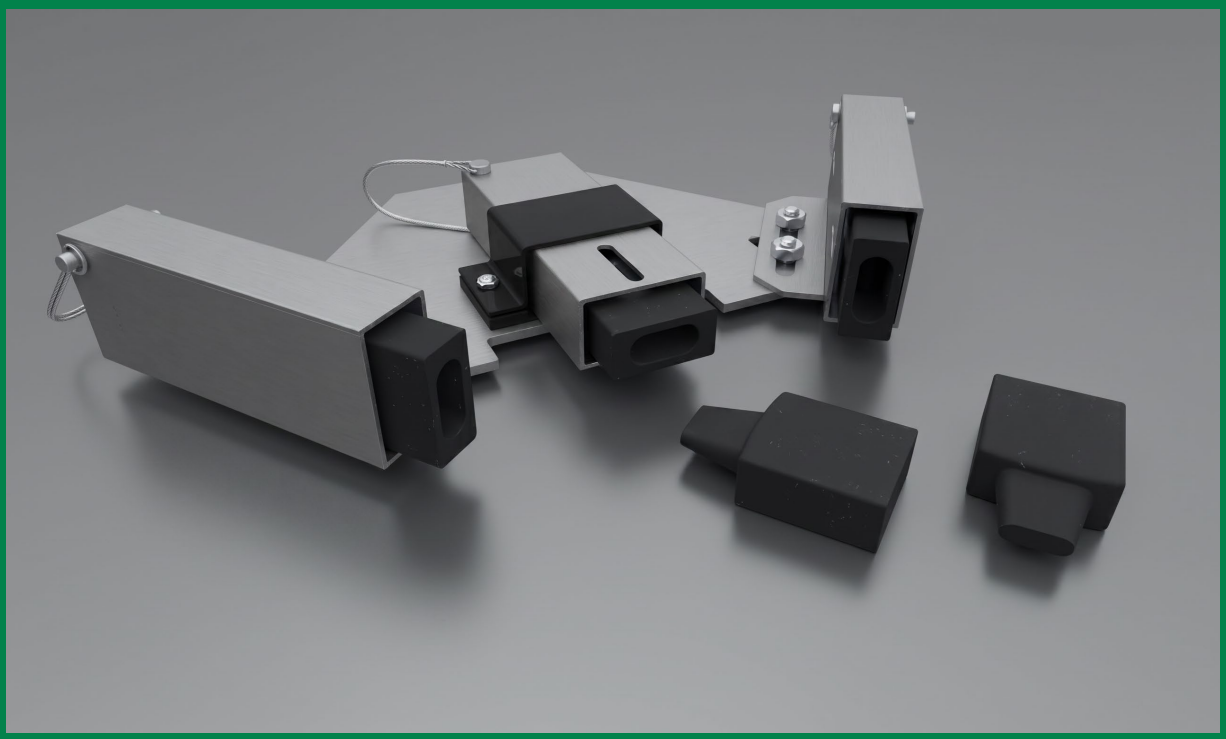
After

The wear protection element bonds evenly to the metal surface, gradually fills microscopic irregularities and distributes pressure uniformly.

Proven Protection for AS/RS Stacker Cranes

SPC® provides dry, clean and long-term wear protection for wheels, rails and guide rollers. Our systems have been used for many years in automated high-bay warehouses, cold stores and demanding logistics facilities.

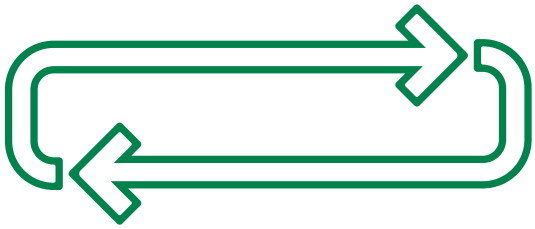
Together with operators, maintenance teams and system builders, we develop practical solutions that reduce failures, lower maintenanceeffort and significantly extend the service life of heavily loaded components.



Designed for Continuous Operation

Whether for a new installation or a retrofit during ongoing operation, SPC® systems can be flexibly adapted to the individual system. The dry protective coating is continuously transferred to the contact surfaces, providing stable friction levels, cleaner rail areas and less metal abrasion.

Application-specific brackets enable a simple, robust and low-maintenance installation.



Higher System Availability Less Downtime

Long-standing customers use SPC® to reduce wear-related failures at an early stage and improve the operational reliability of their AS/RS stacker cranes. The protective coating forms continuously on the loaded contact surfaces and supports smoother interaction between the wheel and rail. This protects components, makes maintenance activities more predictable and sustainably extends the service life of heavily loaded parts.

TRAVEL RAILS

SPC® traction blocks are designed for applications where traction and running stability are critical, particularly under high loads and changing operating conditions.



Application

SPC® traction coatings are used wherever acceleration, braking or lateral forces must be transferred reliably. Typical applications include the running surfaces of drive wheels and the rail head. The objective is stable power transmission with a controlled higher coefficient of friction, reducing slip, unstable travel movements and wear-intensive peak loads over the long term.

Friction

SPC® traction blocks modify the coefficient of friction to 0.35 µ in a controlled and repeatable manner. The objective is not maximum friction but stable and uniform power transmission. This reduces microslip, uneven load distribution and local peak loads that typically lead to increased wear on wheel treads and flanges.

Benefits

SPC® traction blocks provide effective anti-slip performance and ensure stable power transmission even under high loads. They withstand high contact pressures and create a permanent, continuous coating that builds evenly during operation. The solution is environmentally friendly and supports reliable and predictable system operation.

LIFT RAILS

SPC® low-friction blocks are designed for applications focused on wear reduction and material protection at a controlled low coefficient of friction.



Application

SPC® low-friction coatings are used specifically on the lift rails and guide rollers of AS/RS stacker cranes. In these heavily loaded contact areas, friction, lateral forces and repetitive movements frequently cause increased abrasion. The coating reduces these loads, improves load distribution and therefore supports smoother running characteristics, lower material wear and longer component service life.

Friction

By selectively lowering and stabilizing the coefficient of friction to 0.04 µ, SPC® low-friction blocks reduce surface stress, abrasion and local heat generation. The coefficient of friction is modified in a controlled and uniform manner, distributing contact stresses and slowing harmful wear mechanisms. This supports uniform use of the available design life across all involved components.

Benefits

SPC® low-friction blocks are graphite-free, metalbonding and designed for high contact pressures. The coating remains permanently on the contact surface and does not migrate. This reduces friction, abrasion and material fatigue on lift rails and guide rollers without affecting the precise guidance of the AS/RS stacker crane. The solution operates dry, clean and with minimal maintenance.



Four AS/RS Stacker Cranes, Two Comparison Pairs, Measurably Lower Wear

In a direct comparison, two identical pairs of units were examined over the same period. One AS/RS stacker crane in each pair continued operating unchanged as the reference unit, while the second was equipped with SPC®.

- **Cranes 3 and 7 continued operating unchanged.**
- **Cranes 2 and 4 were equipped with SPC®.**

The wear depth of the drive wheels and the amount of metal abrasion in the travel area were then measured over time, documented and directly compared.

Empirical Test Series Confirms an Average Wear Reduction of 68%

Over a period of approximately four months, the wear depth of the reference units increased by an average of 0.30 mm. On the units equipped with SPC®, the average increase was only 0.095 mm. This represents 68% lower wear progression on the drive wheels included in the measurement series.

	Increase without SPC®	Increase with SPC®
Crane 3/2 – Wheel 1	0,45 mm	0,08 mm
Crane 3/2 – Wheel 2	0,25 mm	0,10 mm
Crane 3/2 – Average	0,35 mm	0,09 mm
Crane 7/4 – Wheel 1	0,19 mm	0,10 mm
Crane 7/4 – Wheel 2	0,31 mm	0,10 mm
Crane 3/2 – Average	0,25 mm	0,10 mm

*Full measurement series available on request.

The direct comparison shows that SPC® stabilizes wheel geometry, reduces material loss and minimizes the formation of metallic particles on wheels and rails. The contact zone is sustainably relieved. Operators benefit from longer maintenance intervals, fewer wheel replacements and lower downtime, sparepart and maintenance costs. At the same time, the availability and operational reliability of the AS/RS stacker cranes increase throughout their service life.

High Return on Investment

Through longer maintenance intervals, fewer wheel replacements and lower downtime and maintenance:

COMPARISON

SPC® in a Field Trial: Test Crane vs. Control Crane

For customers who have not yet used SPC®, a direct comparison between one retrofitted AS/RS stacker crane and a comparable control unit provides a simple way to visibly assess the function and effect of the system. One AS/RS stacker crane is equipped with SPC®, while a second comparable unit continues operating without SPC®. Regular aisle cleaning allows newly forming deposits and metal abrasion to be observed and compared over several weeks.

The difference is directly visible during operation: while the control crane continues to produce visible metal abrasion, the running surface of the SPC®-equipped crane remains significantly cleaner. This makes the reduction in friction and wear easy for the customer to verify under real operating conditions.



Week 1: Test Crane



Week 1: Control Crane



Week 3: Test Crane



Week 3: Control Crane



Week 8: Test Crane



Week 8: Control Crane

Test Crane with SPC®

After several weeks of operation, the SPC®-equipped AS/RS stacker crane shows a visibly cleaner running surface and significantly reduced metal abrasion. The effect of the system can therefore be directly identified and documented.

Control Crane without SPC®

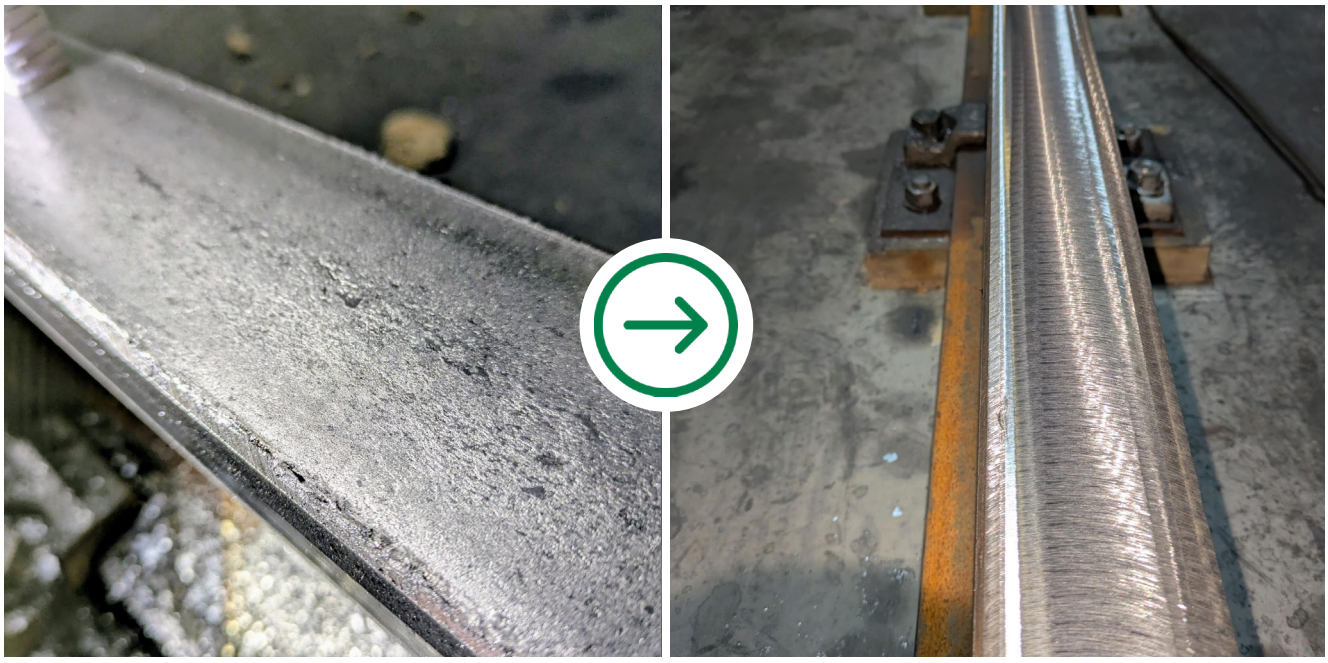
Despite aisle cleaning, visible abrasion deposits reappear on the control crane without SPC®. The comparison makes the ongoing wear visible and clearly demonstrates the difference compared with the SPC®-protected test unit.

TRAVEL RAIL GRINDING

Less Wear, Fewer Vibrations, Higher Operational Reliability

Travel rails are a central component for the smooth and safe movement of AS/RS stacker cranes. Daily operation gradually creates wear patterns such as scoring, unevenness, material buildup and worn running tracks. These changes can cause increased vibrations, unstable travel movements and additional loads on wheels, bearings, guide rollers and drive components.

Targeted grinding of the travel rails restores a smooth running surface and improves the contact area between the wheel and rail. This can reduce vibrations, limit further wear and extend the service life of the affected components. At the same time, the AS/RS stacker crane runs more smoothly and the required maintenance effort can be sustainably reduced.



Before

The worn travel rail shows clear running marks, scoring and uneven contact surfaces. These irregularities can cause vibrations, increased wheel wear and additional loads on the travel unit and drive components.

After

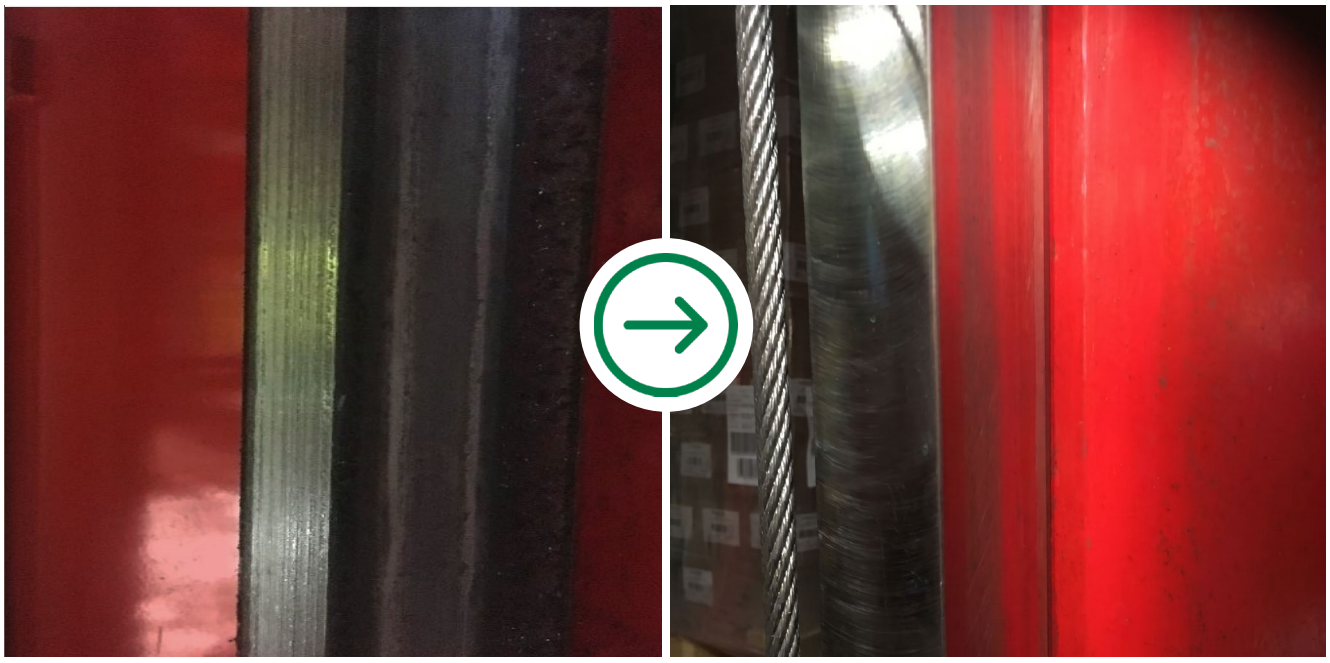
After grinding, the running surface is significantly more uniform. The improved contact between the wheel and rail reduces vibrations, ensures smoother movement of the AS/RS stacker crane and limits further wear.

LIFT RAIL GRINDING

Precise Lift Carriage Travel and Reduced Loads on Guide Components

Lift rails perform a decisive function in the vertical movement of an AS/RS stacker crane. Over the course of operation, wear, scoring, edge formation and localized damage can develop on the running surfaces. These irregularities directly affect the movement of the lift carriage and can cause increased noise, impacts, uneven guidance and additional wear on rollers, bearings and guide elements.

Professional grinding of the lift rails selectively removes damaged surface areas and restores more uniform running surfaces. The lift carriage then moves more smoothly, the contact conditions between the rollers and rail improve, and mechanical loads within the lifting system are reduced. This supports reliable system operation and helps prevent consequential damage at an early stage.



Before

The lift rail shows visible running marks, scoring and damaged surface areas. This can cause uneven lift carriage movement, resulting in noise, impact loads and increased wear on rollers and guide elements.

After

After grinding, the lift rail surface is more uniform and has been cleanly refinished. The lift carriage can be guided more smoothly, reducing mechanical loads on rollers, bearings and guide components.

CONDUCTOR RAIL CLEANING

Contamination and deposits on conductor rails can impair power transmission and lead to leakage currents, voltage spikes and increased wear. Regular professional cleaning improves operational reliability and supports a stable and dependable power supply.



Clean Conductor Rails for Reliable Operation

- **Improved power transmission- through thoroughly cleaned contact surfaces.**
- **Reduced leakage currents and voltage spikes through the removal of deposits.**
- **Less wear and fewer faults on conductor rails and current collectors.**
- **Additional inspection of the conductor rails, copper thickness and current collectors during cleaning.**

Results That Matter

95%

Reduces the required cleaning time by up to 95% compared with manual cleaning.

Cleaning can be carried out quickly and with minimal system downtime. Depending on the installation, part of the work may even be completed during ongoing operation, thereby minimizing interruptions.

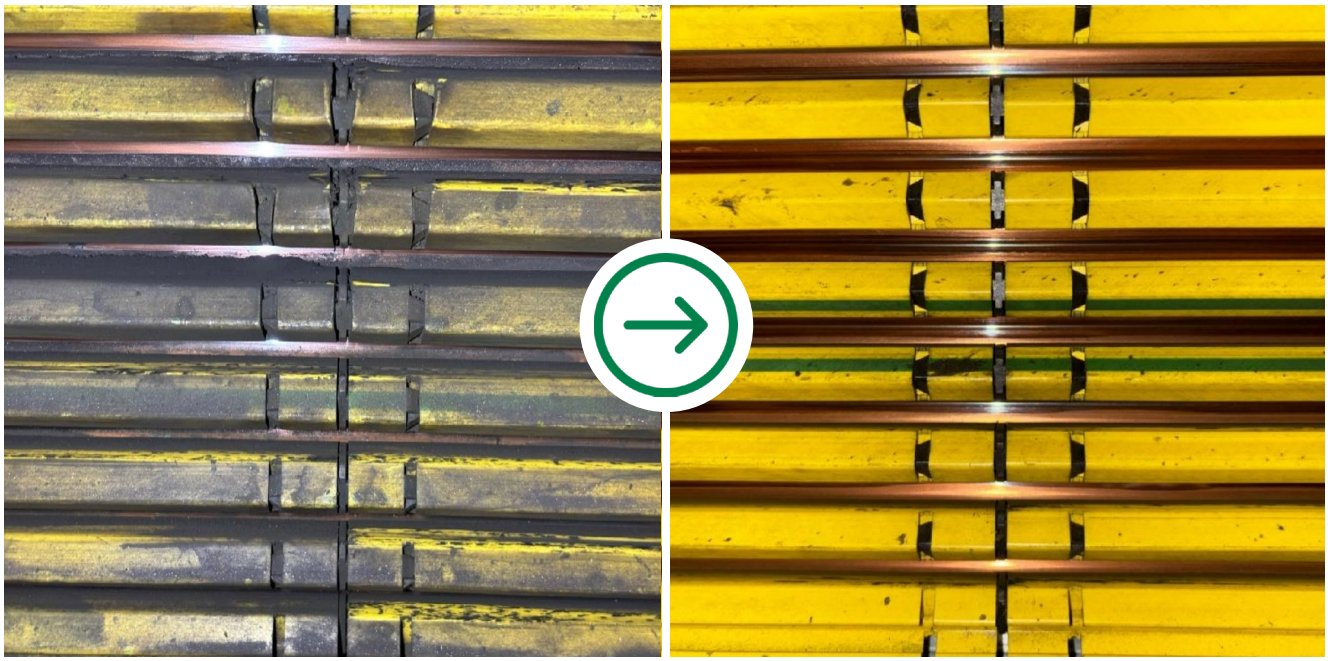


CASE STUDY

Before vs. After: Conductor Rail Cleaning

During ongoing operation, dust, metal abrasion, oil residue and other contaminants increasingly accumulate on conductor rails. These deposits can impair reliable current transfer, increase wear on current collectors and contact surfaces and eventually lead to operating faults or unplanned system downtime.

Purely manual cleaning is often time-consuming, reaches difficult-to-access areas only to a limited extent and does not always provide a uniform result. Professional conductor rail cleaning removes even stubborn contamination thoroughly and in a controlled process. This creates the conditions for reliable power transmission, safe system operation and a longer component service life. At the same time, maintenance effort, failure risks and potential consequential costs can be sustainably reduced.



Before

The left image shows a heavily contaminated conductor rail with clearly visible deposits of dust, abrasion and general dirt. This contamination can impair current transfer, increase wear on the contact surfaces and cause faults or unplanned system downtime. Without regular cleaning, the risk of unreliable system operation and higher maintenance costs continues to increase.

After

The right image shows the conductor rail after professional cleaning. Dust, abrasion and stubborn deposits have been thoroughly removed and the contact surfaces have been cleaned evenly. The result creates ideal conditions for reliable power transmission and safe system operation. At the same time, wear, maintenance effort and failure risks are reduced.

OUR SERVICES



Consulting

Sound consulting provides the basis for efficient and economical solutions. Together, we identify optimization potential and develop tailored concepts for your system.

Analysis

Precise measurements provide clarity on the condition of your system and identify required action at an early stage. This creates a reliable basis for targeted optimization and lasting improvements.

Reconditioning

Our professional reconditioning work ensures that key components are restored quickly, correctly and ready for operation. This reduces unnecessary downtime and supports smooth and reliable system operation.

Prevention

Preventive measures minimize wear and consequential damage at an early stage. This increases system availability while reducing long-term maintenance effort and operating costs.

Preventive AS/RS Stacker Crane Maintenance for Higher Availability and Lower Costs

All measures and services presented share one common goal: to protect AS/RS stacker cranes over the long term, reduce wear and increase system availability. This minimizes downtime, stabilizes operational processes and sustainably reduces costs.

Whether rail grinding, SPC® wear protection, conductor rail cleaning or targeted mechanical repairs, every measure helps protect rails, wheels and guide components, reduce material wear and sustainably lower maintenance effort. This stabilizes operational processes, prevents unplanned downtime and makes maintenance work easier to schedule.

The result is greater operational reliability, longer component service life and improved cost efficiency across the entire system.

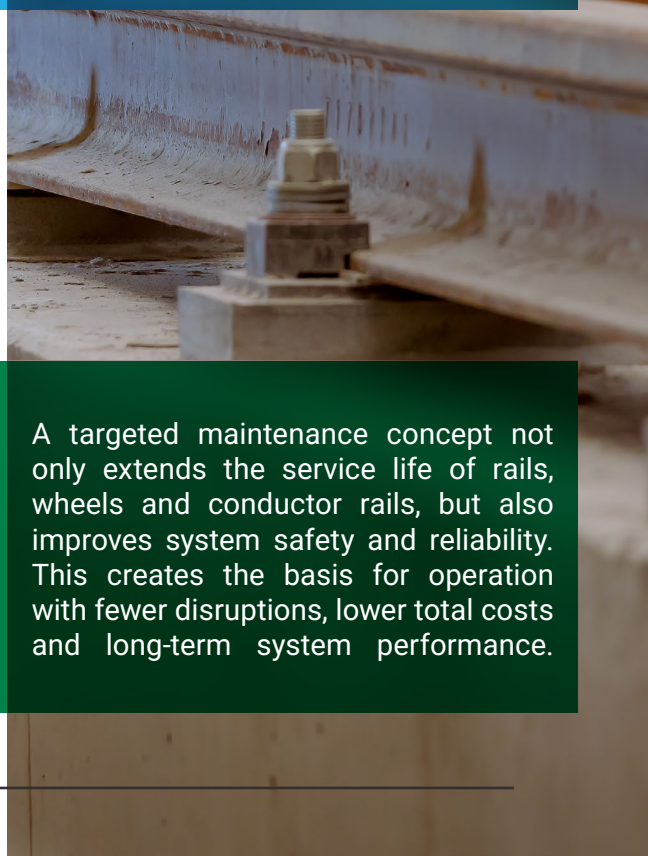


More Control During Ongoing Operation

AS/RS stacker cranes under preventive care operate more smoothly, reliably and with less wear. Travel and lifting movements are stabilized, and faults can often be prevented at an early stage. At the same time, the need for unplanned maintenance work and short-notice repairs is reduced.

Fewer Failures. Better Cost Efficiency.

Preventive measures directly improve system availability. Reprofiled rails, clean conductor rails and targeted wear protection help reduce consequential costs over the long term and keep them predictable.



Long-Term Reliability for AS/RS Systems

A targeted maintenance concept not only extends the service life of rails, wheels and conductor rails, but also improves system safety and reliability. This creates the basis for operation with fewer disruptions, lower total costs and long-term system performance.

LET US OPTIMIZE YOUR AS/RS STACKER CRANES TOGETHER.

Individual solutions to reduce wear, extend service life and increase availability while the equipment remains in operation.

ANALYSIS. OPTIMIZATION. PREVENTION.

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