

FROM BREAKDOWN TO BENCHMARK: BEST PRACTICES IN WEARING COMPOUND USE FOR MINING MAINTENANCE

Lower Risk, Extend Equipment Life, and Improve Uptime with Scalable Solutions



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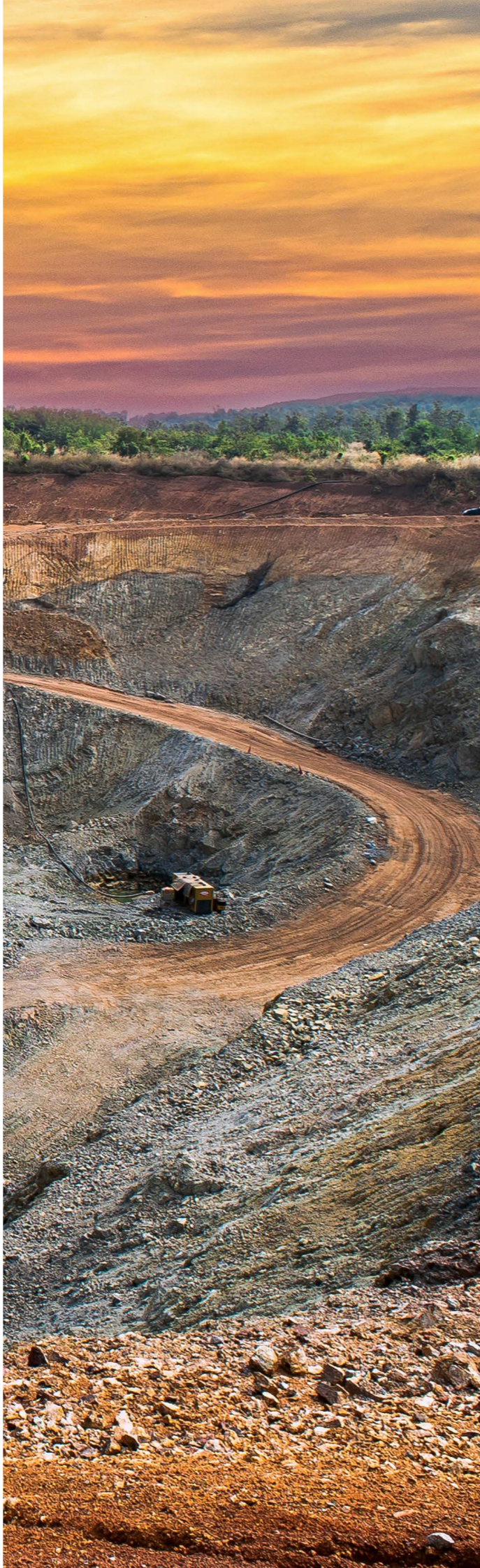
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FOREWORD.

Whether you're operating in the Pilbara, Mozambique, Quebec, or the Norte Grande, one challenge is universal: unplanned downtime and its staggering cost. In minerals processing, a single interruption can exceed half a million USD per hour, while maintenance may account for up to 50% of total operating costs, particularly in aging plants.

With older infrastructure, a shortage of skilled labour, and growing pressure to improve performance across multiple sites, maintenance leaders are being asked to deliver more with less. The challenge isn't just technical. It's strategic. Many operations lack visibility into what world-class maintenance truly looks like.

Yet even small, targeted improvements in wear prevention can unlock significant value: reducing failures, extending equipment life, and delivering measurable cost savings.

This whitepaper shares practical, scalable strategies to help reduce downtime, improve reliability, and build a strong business case for change—from breakdown to benchmark.

Developed in collaboration between Henkel Adhesive Technologies and the Competence Centre for Mining & Resources (CCMR) at the German-Australian Chamber of Industry and Commerce, this resource pulls together the latest insights from experts in the field and best practices from the industry. Henkel's partnership with CCMR means that the information and insights you'll find here are rooted in real-world applications that have been field-tested and refined across the world.

Readers can expect to find valuable insights into how adhesive solutions can optimise maintenance cycles, extend the lifespan of critical equipment, and improve safety standards within their operations. We also share best practices for implementing these technologies, illustrated with case studies featuring the most common trouble spots: chutes, belts, cyclones and more.

We believe in fostering a cooperative and proactive maintenance culture, where teams are encouraged to flag potential issues before they escalate into costly failures. We also explore how effective training and ongoing education can fill knowledge gaps and deepen understanding of wear protection technologies; particularly around choosing the right product and improving application.

The future of mining hinges on innovation and collaboration. Sharing our knowledge, experiences and insights with each other will allow us to tackle pressing issues like high wear in minerals processing and build a more resilient industry, together. By embracing these best practices and leveraging cutting-edge technologies, we can create a more efficient, safer, and more sustainable mining landscape for years to come.

Juergen Wallstabe
Senior Cluster Manager, Mining and Resources
German-Australian Chamber of Industry and Commerce

Matt Greaves
General Manager, Adhesive Technologies, Henkel Australia & New Zealand

INTRODUCTION.

HOW WEAR CAUSES DOWNTIME

Is minerals processing tougher on equipment than any other industry? It certainly seems that way. Drilling, processing, and excavation equipment are constantly exposed to heavy vibration and stress, increasing the risk of failures.

You are familiar with the challenges: damaged tiles in chutes, misaligned gaps on crushers, and worn rubber on conveyor belts. These issues can lead to unplanned downtime, which are costly and disruptive. Downtime costs for the larger players in the market can easily run to half a million USD per hour.

We recognise the difficulties you face with equipment in harsh environments. Choosing the right adhesives, sealants, and functional coatings will protect against impacts from minerals, rocks, and debris, especially in high-wear areas of wet slurry processing. By safeguarding your equipment, you can minimise downtime, reduce costly repairs, and extend operational lifespan.

AVOIDING URGENT REPAIR

Ask any reliability engineer or maintenance lead what their number one priority is, and their answer is likely to be avoiding urgent repair.



Urgent repair – otherwise known as breakdown maintenance – is costly in terms of labour materials and production loss, and bad for production planning. Money piles up every second, minute and hour of an unplanned shutdown. That’s when a fast-curing product becomes critical.

Zhonghua Zhang

Application Engineering Lead, Henkel APAC

FROM REACTIVE TO PROACTIVE MAINTENANCE

In terms of pay-off, moving from reactive to proactive maintenance is a high-impact strategic choice. By addressing potential issues before they escalate, you enhance equipment reliability and keep operations running smoothly. This shift not only results in more uptime and lower costs but also eases the burden on your maintenance engineers. There are multiple ways to make this shift, and wear prevention technologies have a major part to play.

WHAT ARE THE OTHER KEY CHALLENGES TO BE SOLVED?

Sites and Centres of Excellence (CoE) look for continuous improvement in reducing maintenance cycles, enhancing equipment longevity, and improving safety – all of which reduce costs.



IMPROVING PLANT EFFICIENCY

- Reduce maintenance cycle times.
- Enhance equipment longevity to increase Mean Time Between Failures (MTBF).
- Lower downtime and associated costs.



INCREASING EQUIPMENT RELIABILITY

- Avoid costly urgent repairs.
- Decrease Mean Time to Repair (MTTR) and prevent unscheduled downtime.
- Minimise chronic equipment failures and environmental risks.



STRENGTHENING PLANT SAFETY

- Prevent safety hazards from unreliable machinery.
- Train employees to improve reliability and reduce downtime.
- Create a safer work environment and protect your license to operate.
- Choose sustainable products that protect handlers and the environment through avoiding harmful chemicals.



REDUCING COSTS

- Extend asset life and lower replacement costs.
- Achieve cost savings through reduced downtime.



WHERE CAN SIGNIFICANT PERFORMANCE IMPROVEMENTS BE FOUND?

We all know what the ideal process looks like—but making it happen consistently across different sites isn’t easy. Varying conditions, team experience, and time pressure can all create gaps between potential and performance.

The good news? There are real, achievable gains on-site. The key is **choosing the right wear protection solution—and applying it effectively**. Yet this step is often underestimated. The best-fit products may be missed, and critical factors like surface prep or cure times overlooked, leading to avoidable losses in reliability, safety, and cost.

One way forward is **smarter product selection**. High-quality adhesives, sealants, and coatings that are easy to apply and don’t require specialised labour can minimise downtime and keep operations moving.

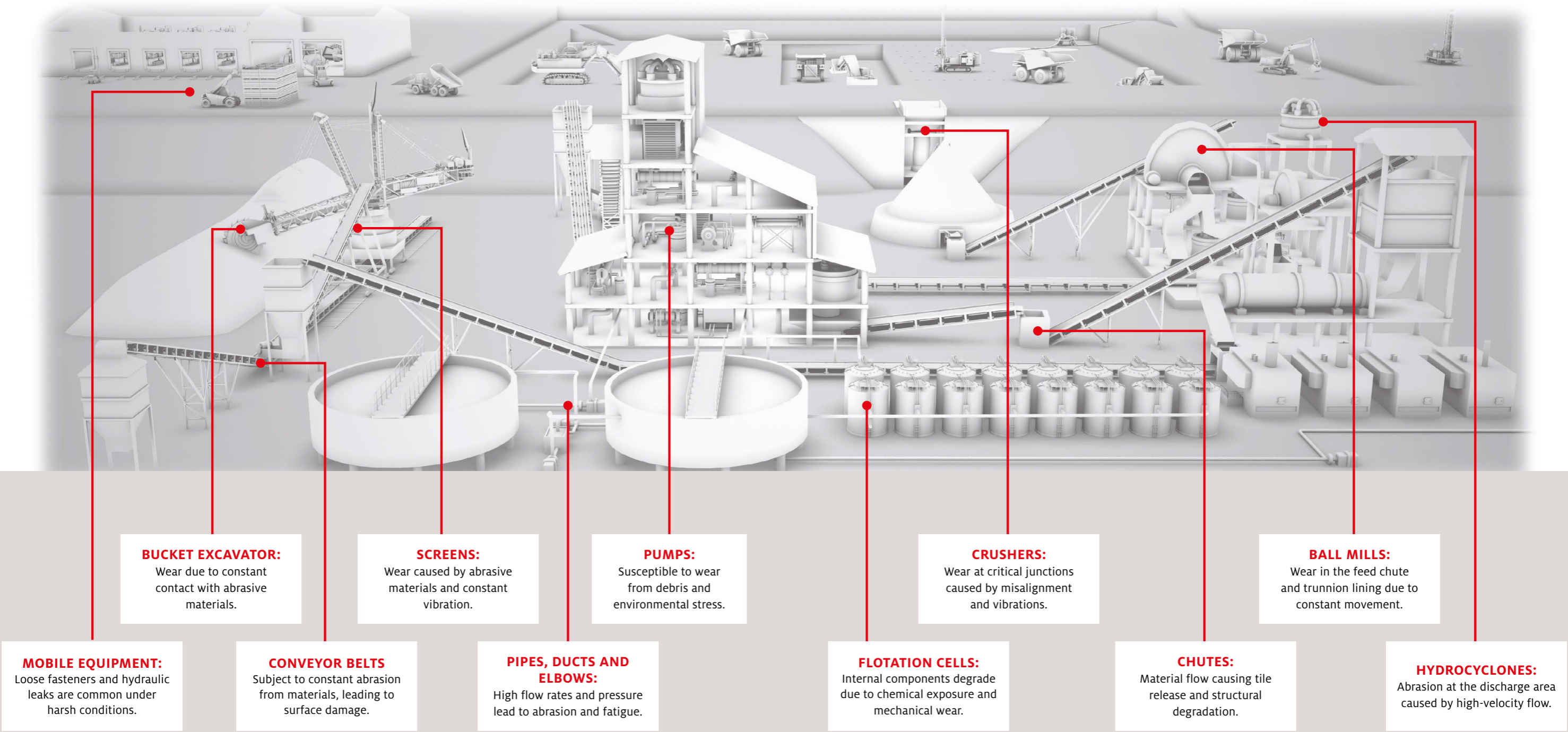
While the wear protection category is mature, Henkel continues to drive innovation through steady material science advancements. Still, true performance breakthroughs rarely come from products alone—they come from **a more holistic view**. To deliver real, long-term gains, we must look at the entire wear process—not just the materials, but how and where they’re used.

CHAPTER 1.

TROUBLE SPOTS: HIGH WEAR AREAS IN MINERALS PROCESSING

The science of reducing wear in machinery has come a long way in the last 25 years, but the reality still is that any breakdown along the long and varied value chain has the potential to cause unplanned downtime.

Broadly, these are the highest-wear areas that suffer from erosion, corrosion, abrasion, and impact damage.



CASE STUDY: OPTIMISING MILL PERFORMANCE WITH ADVANCED WEAR PROTECTION

THE CHALLENGE

An iron ore mine in China was facing severe wear and repeated impact damage to its SAG mill shell. This not only complicated the installation of new liners but also posed a high risk of unscheduled shutdowns, leading to increased maintenance time and lost production.

THE SOLUTION

Henkel recommended the use of **LOCTITE® PC 9593 Fast Cure High Impact Wearing Compound**. After thorough surface cleaning and preparation, the compound was applied directly to the mill shell. Its advanced formulation was specifically designed to withstand secondary impact from steel balls and ore, while enabling immediate liner installation without altering existing mill re-lining procedures.

THE OUTCOME

The application of LOCTITE® PC 9593 delivered outstanding results across performance, productivity, and safety:

- **Superior Impact Resistance:** After four months of continuous operation, the coating remained tightly bonded to the shell. This strong adhesion helped reduce the risk of liner cracking and effectively avoided unplanned shutdowns.
- **Faster Curing = Higher Profitability:** PC 9593 cured fully in just **4 hours**, compared to the **8-hour** curing time of the previous solution. Liners could be installed after only **20 minutes** of application, saving around **10 hours** of downtime—translating to over **\$29,000 USD in additional profit**.
- **Enhanced Protection:** The compound provided reliable short-term resistance to the intense severe of steel balls and ore, serving as a secondary protective barrier for the mill shell.
- **Improved Safety and Uptime:** By preventing liner cracking and reducing shutdowns, PC 9593 also contributed to a safer and more stable operating environment.



TYPES OF WEAR PROTECTION SOLUTIONS

Engineers employ an arsenal of solutions to reduce wear along this value chain; with the main five being ceramic tiles, wear plates, work hardening steel, rubber, and wearing compounds.

WORK HARDENING STEEL: IMPACT AND ABRASION

Work hardening steel such as manganese steel is used with crushers, chutes, bin liners, and anywhere where there is hard impact from large pieces of rock.

WEAR PLATES: SEVERE ABRASION

Made from durable materials like high-carbon steel, wear plates are installed on high-wear areas of equipment to absorb impact and friction from abrasive materials, minimising direct contact between machinery and abrasive substances.

CERAMIC TILES: ABRASION, TEMPERATURE EXCHANGE

Used in chutes where there are fine rocks, tanks, apron feeders, transfer stations, impact beds, conveyer transfer points, drum pulleys, drive drums.

RUBBER: CORROSION AND EROSION

Difficulty to repair, rubber is used in transport of material in cases where you have control of fragmentation. Rubber conveyer belts, sacrifice belts (compound between steel and rubber), and used in pumps, agitators, tanks, pipes, slurry flow, concentrates.

WEAR COMPOUNDS: RAPID APPLICATION AND REPAIR

When every minute counts during expensive downtime, wear compounds save crucial time and money in repair work. Surface treatment of equipment takes only a few hours of curing and then can get back to work. While ceramic, steel, and rubber repair work can require several roles and is usually completed off-site, wear compounds can be applied in-situ by only one or two people. As an inexpensive material compared to the alternatives above, the use of wear compounds results in significant cost savings.

UNDERSTANDING THE COSTS OF HIGH WEAR

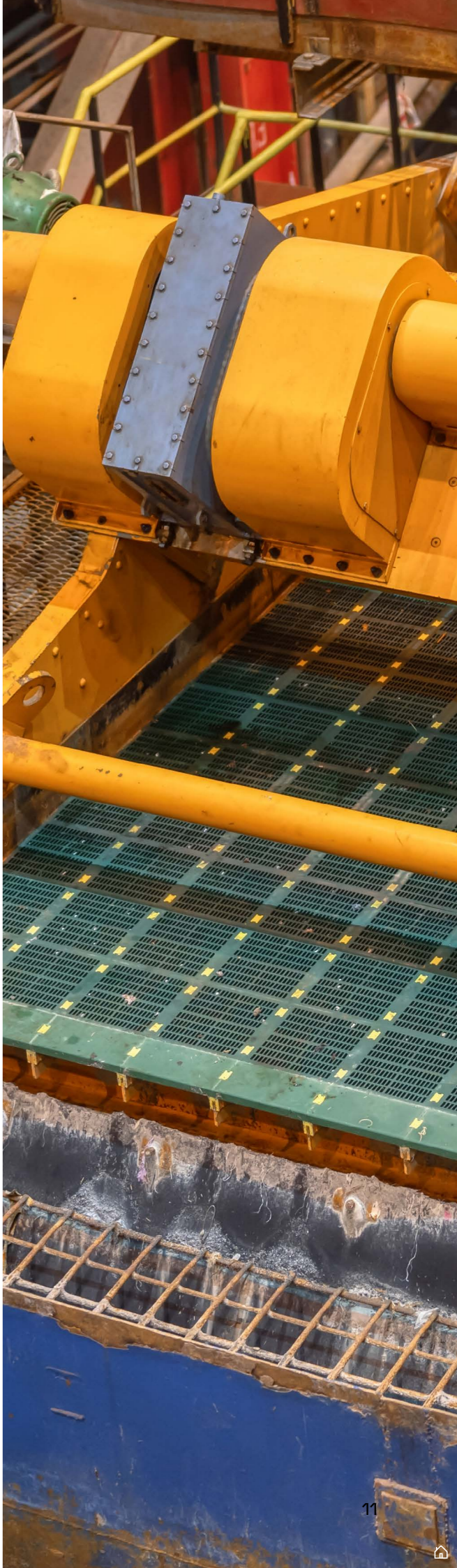


Unplanned downtime means additional costs, additional risks. A wear protection solution that helps us get as close as possible to eliminating unplanned downtime is an obvious and highly valuable choice — especially when you consider how cost-effective it is compared to the high cost of inaction.

Asset Performance Manager,
Global Top 10 mining company

The costs of high wear can be staggering. While parts, external contractors, and overheads are significant, they're nothing compared to the lost productivity during unplanned downtime.

CASE STUDY: BREAKING THE DOWNTIME CYCLE WITH A RESILIENT APPROACH TO SCREEN MEMBRANE WEAR



LENGTH OF DOWNTIME

The duration of downtime is a major factor. Big players can reline a mill in **2 to 3 days**, whereas others may take up to **7 days**. This difference can lead to financial losses in the millions. For example, downtime for major players in Western Australia can reach **\$650,000 USD per hour**. The impact of equipment being down, with workers standing idle, adds to the urgency for efficient maintenance strategies.



EXTERNAL CONTRACTOR COSTS

When machinery fails unexpectedly, sites may choose to call in external contractors or breakdown crews which can escalate costs dramatically. Hiring specialists last minute adds financial strain and can prolong downtime, further impacting productivity.



TOTAL COST OF OWNERSHIP (TCO)

Replacing machinery due to high wear can significantly affect the Total Cost of Ownership. While capital equipment costs are one aspect, ongoing maintenance and the costs associated with lost productivity during replacements must be factored in. Investing in wear prevention can extend equipment life and reduce the frequency of costly replacements.

THE CHALLENGE

The horizontal membrane of a screen beam was experiencing significant wear, leading to frequent downtime and disruptions in operations at a leading mine in New South Wales, Australia. The mine needed a durable solution to enhance the longevity of the screen components.

THE SOLUTION

To address the issue, Henkel recommended a complete rebuild of the worn-out membrane using **LOCTITE PC 9313 High Impact Wearing Compound**, complemented by a base coat of **LOCTITE PC 7227 Brushable Ceramic**. This approach provided a robust protective layer to withstand the demanding conditions of the mining environment.

THE OUTCOME

Previously, the mining operation faced a maintenance cycle of just 3 to 4 weeks before requiring attention. Since applying Henkel's solution, the entire screen has successfully operated for **16+ weeks with minimal wear**. The customer has since approved the use of this product on-site for future applications, showcasing its effectiveness and reliability.



PLANNED VS. UNPLANNED DOWNTIME

Planned downtime allows businesses to prepare and mitigate costs, but unplanned downtime disrupts production and introduces additional risks. Unexpected repairs not only incur extra costs but can also lead to significant operational inefficiencies.



SAFETY CONSIDERATIONS

Tasks such as relining mills or repairing conveyor belts come with inherent risks such as lifting activities, electrical work, and mobile pieces that potentially store energy.



The safest thing to do in mining is to reduce the amount of work you need to do.

Manager,
Asset Management &
Automation, Rio Tinto

CHAPTER 2.

APPLICATION SHORTFALLS THAT REDUCE EFFECTIVENESS

SELECTING THE RIGHT PRODUCT

Mineral processing equipment operates in demanding conditions, and selecting the incorrect solution can lead to unexpected failures and costly downtime. That’s why leading vendors prioritise getting to know your specific processes, the equipment involved, and the challenges you encounter daily. By taking the time to understand your situation, they can recommend the most suitable wear protection solutions tailored to your needs.

We understand why less-suitable products are sometimes chosen. There can be significant effort involved in overturning inflexible procurement decisions. Experienced workers may stick with a product and vendor they’ve relied on for years. Additionally, engineers with less experience in high-turnover teams often lack the knowledge and guidance needed to make informed choices.



Ensuring correct application is just as important as choosing the right product.

Zhonghua Zhang
Application Engineering Lead,
Henkel, APAC

PRODUCT SELECTION BASED ON APPLICATION NEED

Maintenance engineers know that the chemistry of products is the key factor in handling different materials under varied operating conditions. Henkel constantly innovates to develop high-impact solutions to meet our customer needs – illustrating some examples below:

Application on metal / ceramic surfaces	Product selection – Chemistry
Particle abrasion – dry condition	Ceramic based compound (Aluminium Oxide)
Particle erosion – wet condition	Silicon Carbide compound (SiC)
Particle abrasion along with impact loading – dry condition	Rubber toughened ceramic based compound
Anti-stick – fine particle abrasion resistance – dry condition	Epoxy Silicon Hybrid compound

Getting this selection right makes all the difference, because even the best application techniques won’t save your equipment if the incorrect product is used. If you pick a product that doesn’t match your needs, you increase the risk of unexpected failures and financial losses. Partnering with knowledgeable suppliers who can guide you through the decision-making process is essential for success.

CONSEQUENCES OF IMPROPER APPLICATION

Getting the application process right is critical. Improper application of wear protection solutions can lead to a higher likelihood of equipment failures, severely impacting performance, safety, and overall operational efficiency.

When application is rushed, the potential for costly mistakes increases. This urgency often results in inadequate coverage or improper bonding, leading to accelerated wear and frequent breakdowns.

The consequences of these errors can be far-reaching: equipment may not perform at its best, safety risks can escalate, and maintenance costs can skyrocket due to the need for more frequent repairs or replacements.

It’s important to acknowledge the limitations of on-site repair work, where conditions may not be ideal for optimal application. Therefore, choosing robust and versatile products is essential. Henkel products are designed to meet these challenges, providing reliable performance and durability that can withstand the rigours of demanding environments.

To truly maximise the benefits of wear protection solutions, it’s important to prioritise proper application techniques. We understand that, in the rush to keep things running smoothly, common application mistakes can occur. Let’s take a moment to explore these pitfalls, so we can help you avoid costly setbacks and ensure your efforts truly pay off.

COMMON APPLICATION MISTAKES

1

LACK OF SURFACE PREPARATION

Is it clean? Is it dry? Proper surface prep is crucial for effective bonding. If surfaces are dirty or damp, the product won’t adhere properly, leading to failures. Realistically, however, there are limits to how clean and dry a surface can be made when prepared on-site. Henkel’s products are robust enough to work well under any conditions, even when surface prep is difficult.

2

CONFUSION OVER MIXING INSTRUCTIONS

Getting the mixing right is important, as mixing at the wrong temperature or ratios can impact how well the product performs. Incorrect proportions can compromise the product’s performance and durability. Always follow the recommended guidelines and refer to the Technical Data Sheet (TDS) to ensure accurate mixing of all components.

3

NEGLECTING THE CURING PROCESS

Curing conditions are key for optimal performance. Environmental factors, such as temperature and moisture, can significantly affect curing times. For instance, applying in cold or wet conditions can lead to subpar results, as the mixing and curing times of epoxy-based compounds are inversely proportional to temperature. Again, the best advice is to follow specified curing guidelines to avoid performance issues.



The curing time for one product may be eight hours, but that’s at room temperature. In winter, lower temperatures will alter the curing time, but the people doing the application don’t always take this into account.

Zhonghua Zhang
Application Engineering Lead, Henkel, APAC



Taking a little extra time to ensure proper application leads to significant long-term gains, saving both time and money.

Manager,
Asset Management & Automation
at Rio Tinto Group, Canada

4

IMPROPER THICKNESS OF APPLICATION

Applying the product at the wrong thickness can compromise its effectiveness. For example, a 6mm application may be necessary for certain products to function correctly, depending on the TDS of the product. Adhering to recommended thickness ensures better wear protection.

5

APPLYING ON VERTICAL SURFACES:

When applying products to vertical surfaces, using too much material can cause it to slump or run down. This can lead to uneven application and reduce effectiveness. Controlled application techniques are necessary to ensure proper coverage, while Henkel’s non-sagging product feature is a valuable benefit for vertical application.

TRAINING AND KNOWLEDGE GAPS

Variability in understanding among engineers and site workers can lead to inconsistent application. Robust training programs are essential to ensure that everyone is on the same page about the correct application techniques and product characteristics.

One of the key issues is that the people applying the product don't understand the business case for correct application. Faced with the pressure to reduce downtime, they fail to wait long enough even though a short-term wait of 7 to 10 hours could potentially extend the life of essential equipment by six months to one year.

High Turnover in mining operations can compound the challenges around improper product selection and application techniques. New workers may lack familiarity with products and procedures, but implementing a buddy system and comprehensive training – such as Henkel's Surface Engineering Workshop (SEW) can bridge this knowledge gap.

IGNORING APPLICATION GUIDELINES

Even after training, some workers may overlook application guidelines or standard operating procedures (SOPs). Providing easy-to-follow cheat sheets and reminders can help reinforce best practices.

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Waiting a few more hours of curing time is a small price to pay for a big win, but the case for this isn't always well-articulated.

Asset Performance Manager,
Global Top 10 mining company

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Many of today's engineers may not have a good understanding of what's in the product. The challenge is to educate them on the chemistry and application. A better knowledge of the product and how it works will reduce the likelihood of corners being cut in terms of application areas and procedures.

Kalyan Roychowdhury,
Regional Business Development Manager,
Henkel, APAC

CASE STUDY: REDUCING DOWNTIME AND MAINTENANCE COSTS IN SLURRY PUMP SYSTEMS

THE CHALLENGE

In the slurry pump house of a major ore-handling facility, pipeline bends made of mild steel were frequently failing due to extreme abrasion from high-velocity iron ore slurry. These bends typically wore out and punctured within just 20–25 days.

Replacing pipe sections every 20 days incurred high costs from both downtime and component replacement. Welding repairs often led to leakage due to porosity, and frequent manual inspections across different zones consumed significant manpower.

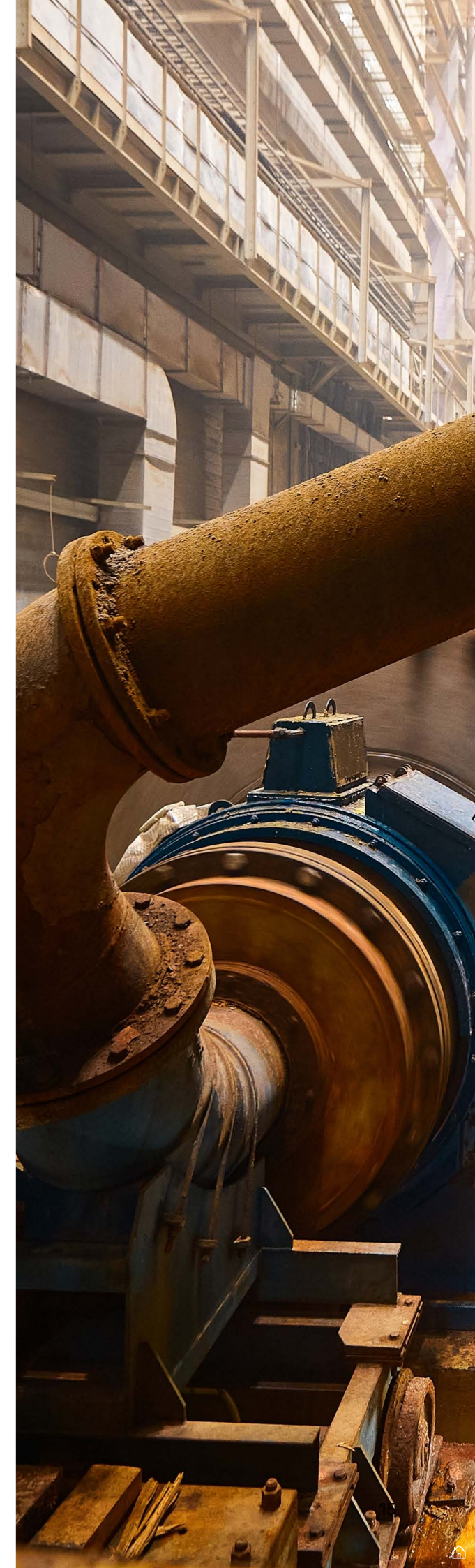
THE SOLUTION

When called in to address the issue, Henkel's application engineer recommended the use of **LOCTITE PC 7332 Silicone Carbide Wearing Compound**, specially designed for wet surfaces—making it ideal for this slurry environment.

A 6 mm internal coating of Loctite PC 7332 was applied inside the pipe bends, forming a protective barrier designed to shield the parent metal from direct slurry impact and wear.

THE OUTCOME

- **Increased Pipe Lifespan:** The coated bends now last an **additional 60 days**, significantly reducing the frequency of replacements.
- **Reduced Downtime:** The solution eliminated the need for two shutdowns, resulting in **a total of 20 hours of avoided unplanned downtime**.
- **Cost Savings:** The reduction in downtime and maintenance translated to a savings of **\$24,000 USD**.
- **Operational Efficiency:** Lower maintenance demands also reduced the need for ongoing manual inspections, freeing up manpower for higher-value tasks.



CHAPTER 3. WINNING STRATEGIES FOR EFFECTIVE WEAR PROTECTION APPLICATIONS

Getting application right has enormous potential to boost equipment longevity and reliability. But there are several aspects of best practice application that extend beyond just the product, all of which need to be considered and understood to get the best outcomes.

DEVELOPING APPLICATION GUIDELINES AND STANDARD OPERATING PROCEDURES (SOPS)

A common question that arises is whether sites should rely on the supplier for application guidelines or develop their own. While this depends on the nature of the site and the organisation, one of the more effective options involves a three-pronged approach, combining:

- The manufacturer's instructions
- Guidance from the Centre of Excellence (building upon learnings and experience)
- Input from the trial site (if any); preferably with similar processing conditions.

VENDOR COLLABORATION AND PARTNERSHIPS

Suppliers have a wealth of knowledge and experience of heavy equipment and the environments they operate in. Develop strong relationships with suppliers of wear materials. Build on expertise and experience in partnership. For new products, it can be advisable to invite the vendor on-site to supervise and educate your teams during the first application.



When it comes to establishing best practices, success often comes from partnerships with leading wear material suppliers. Together, we grow and strengthen our expertise. If they're trying to develop something, we help trial it and share lessons learned to enhance collective knowledge.

Manager, Asset Management & Automation at Rio Tinto Group, Canada

MAINTENANCE APPROACHES:

Planned. Fixed term. Predictive. There is no one "correct" approach to maintenance strategies, which are driven by wear and highly depending on type of material and abrasiveness. But something they all have in common is the aim of minimising the need for reactive maintenance.



Maintenance cycles should be managed in such a way that you not only schedule practices to minimise downtime but also adopt practices – like wear solution product application – to extend the life of assets.

Senior Director,
Growth, Strategy & Development, Rio Tinto

PLANNED MAINTENANCE STRATEGIES

- **Fixed term scheduled replacement:** Time-based, driven by tonnes per hour. Might involve throwing some life of asset away.
- **Predictive:** Based on condition monitoring. The best players can push equipment right to the limit and make the call about when it is about to crack.
- **Proactive:** Extending the life of the component (e.g. with a wear product). Complete repairs and maintenance procedures during scheduled shutdown periods.
- **Prescriptive:** Responding to government regulations.

UNPLANNED

- **Reactive:** Fixing something that has broken due to wear = unplanned downtime.



First, you need to have a robust asset management strategy. Depending on the kind of material you're processing, you need to have a scheduled maintenance program, combined with condition-based monitoring, inspections, and audits. Overlay that with a preventative maintenance schedule.

On the technology side, we are seeing more adoption of remote monitoring, automated systems, and predictive analysis, but the most important aspect is having competent operators on site who can detect and identify maintenance issues.

Senior Director,
Growth, Strategy & Development,
Rio Tinto Group

GETTING THE HUMAN FACTOR RIGHT

How can we improve on correct application outcomes? Processes and procedures are vital, but their effectiveness hinges on proper training and a supportive culture. While compliance with Material Safety Data Sheets (MSDS) is expected, the industry acknowledges that human judgment is irreplaceable.

Empower your team to think critically and take responsibility for their work. Foster an environment where everyone feels comfortable raising concerns and halting work if necessary.

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The workforce is your eyes and ears at the infrastructure itself. If you have an experienced, empowered workforce, they can identify issues immediately and prevent failures. The right workforce will catch a problem before it spreads. If someone sees something (like wearing compound application) not being done properly, they should have the ability to communicate, have that work stop, and get it done properly.

Senior Director,
Growth, Strategy & Development, Rio Tinto



BEST-PRACTICE TRAINING AND SUPPORT

DEVELOP COMPREHENSIVE TRAINING PROGRAMS

Invest in thorough training programs for on-site workers to enhance application techniques.

ENGAGE SUPPLIERS

Ensure you partner with suppliers willing to provide ongoing support and resources to help maintain adherence to best practices.

IMPLEMENT A BUDDY SYSTEM

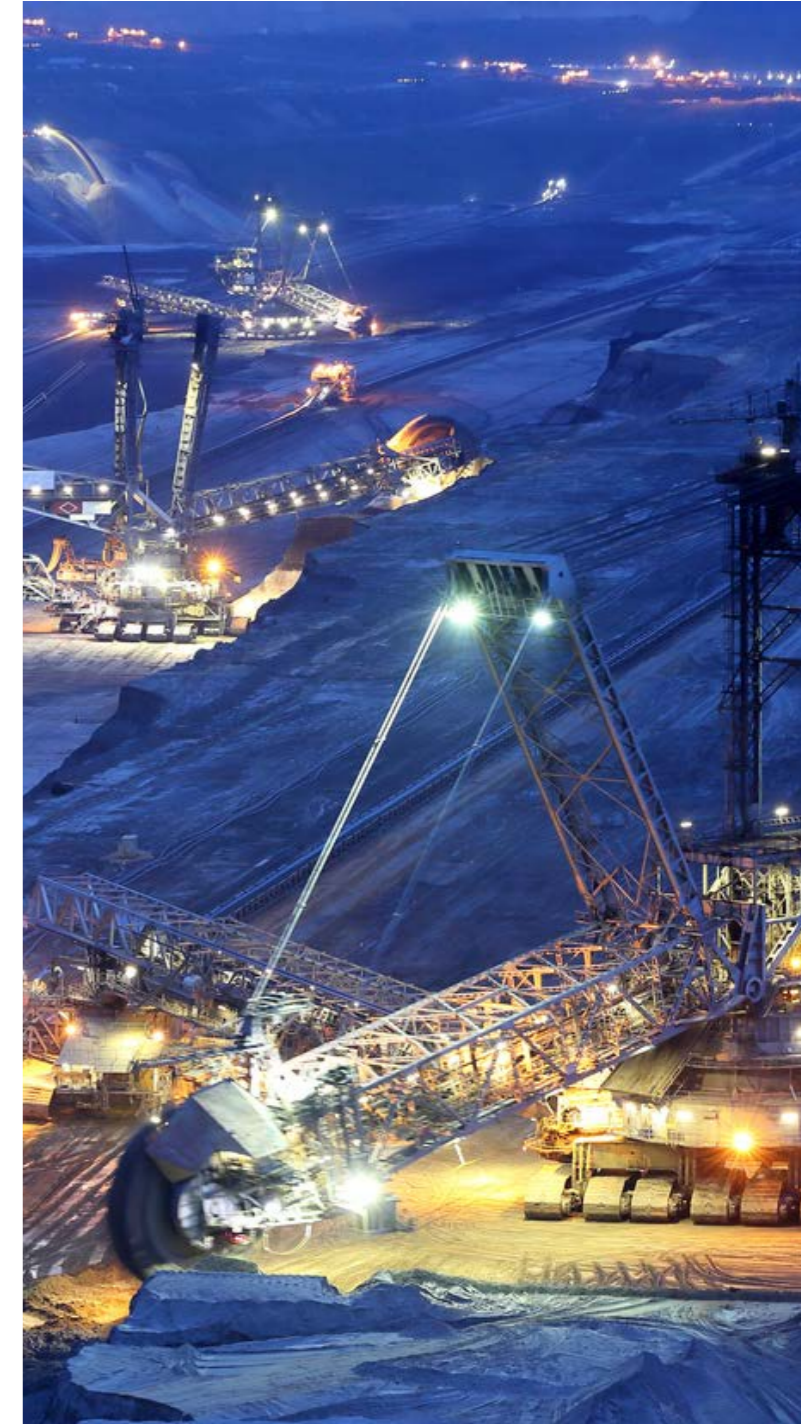
Adopt a buddy system at your sites. Pair new employees with experienced colleagues who can guide them through initial observations and gradually involve them in tasks. After a few sessions, confirm that both parties feel confident in the new employee's ability to perform independently.

CONSIDER DIFFERENT HIRING APPROACHES FOR SKILLS

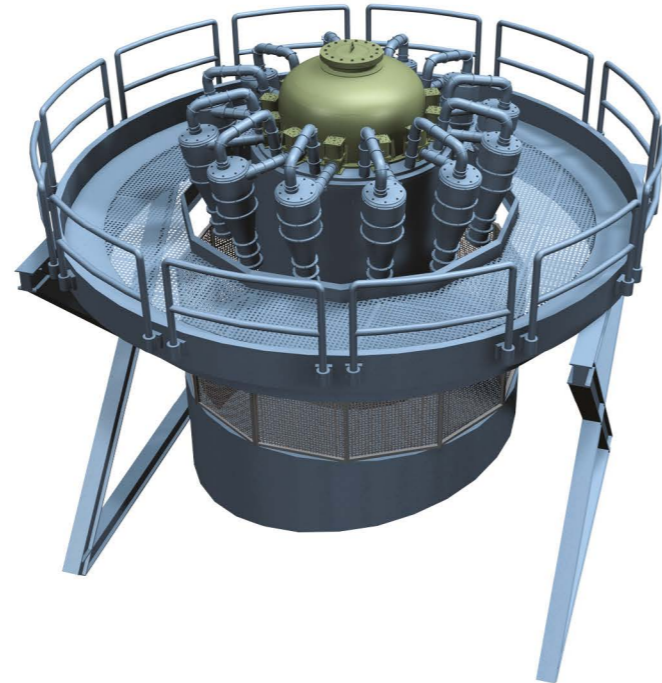
Explore various training models. Some companies benefit from a contractor-based workforce with specific skills, while others prefer a more internal approach with apprenticeships and on-the-job training. A hybrid model can also be effective, bringing in specialist skills as needed.

FOCUS TRAINING CONTENT

Incorporate practical workshops, such as Surface Engineering Workshops, that address specific applications and common challenges. Henkel conducts sessions lasting 1.5 to 2 hours, including theory and hands-on practice with dummy plates where we cover the dos and don'ts, and ensure that teams understand the business case for correct application.



CASE STUDY: HOW A STRATEGIC APPROACH TO CYCLONE REPAIR TURNS WEAR INTO LONG-TERM WINS



THE CHALLENGE

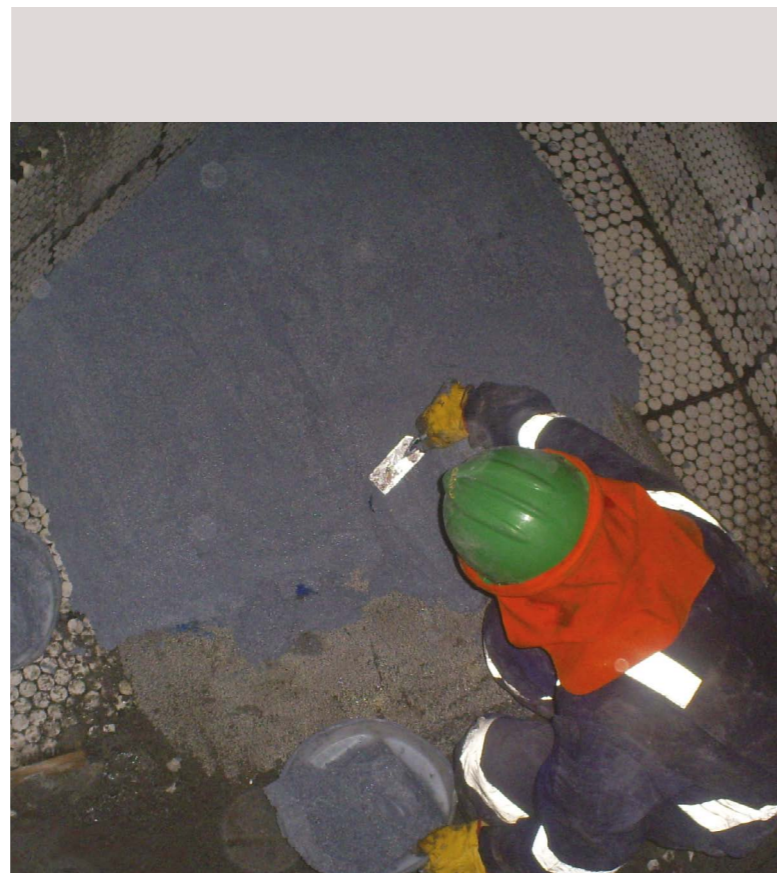
The cyclone underflow discharge pan at a leading coal mine in QLD, Australia, was experiencing extreme wear, which necessitated frequent repairs. The existing product wore out too quickly, leading to constant maintenance. Additionally, there were issues with missing tiles in the cyclone's body, further complicating operations.

THE SOLUTION

To address these challenges, Henkel recommended the use of **LOCTITE PC 9313 High Impact Wearing Compound** to rebuild the affected areas of the discharge pan. This solution provided a durable and long-lasting repair that could withstand the harsh conditions of the mining environment.

THE OUTCOME

The implementation of Henkel's solution resulted in a significant extension of the time between applications of the wearing compound, improving maintenance intervals by quadruple. This improvement allowed the mine to reallocate shutdown resources to other critical areas, enhancing overall operational efficiency. Additionally, the compound was also employed to repair missing tiles in the cyclone's main body, leading to savings of **\$33,000 USD per month** until the unit could be replaced. This case underscores the effectiveness of Henkel's solutions in minimising downtime and reducing maintenance costs.



CHECKLIST:

WHAT TO LOOK FOR IN A PROTECTIVE COATING PROVIDER

- ✓ **Industry partnership:** Choose a supplier committed to understanding the varied conditions and unique challenges in minerals processing.
- ✓ **Solution-oriented approach:** Look for a partner that sells solutions, not just products. Ensure they conduct a thorough survey to identify critical areas for improvement.
- ✓ **Process knowledge:** Ensure the supplier takes the time to understand your specific processes and equipment before recommending products.
- ✓ **Cost-saving and comparative data:** Ask the supplier to deliver data and analysis to help assess ROI (investment versus cost savings or before-and-after cost comparisons).
- ✓ **Training:** Does the supplier offer on-site training to improve your team's product knowledge, help ensure correct application, and improve performance outcomes?
- ✓ **Product trials:** The supplier should be willing to take an iterative approach to product trials, starting at one pilot site and expanding to sites with similar conditions. While supplier lab trials are important, they should not be relied upon alone.
- ✓ **Research and development:** Select a supplier that invests in R&D and is committed to continuous improvement through product development and training.
- ✓ **Environmental responsibility:** Ensure the products do not contain hazardous chemicals such as Diethylenetriamine (DETA) which could potentially lead to worker skin and eye irritations and other health issues if not handled correctly. DETA can also cause aquatic toxicity and soil contamination.
- ✓ **Comprehensive product portfolio:** Look for a complete range of solutions that address the varied challenges in minerals processing, rather than a one-size-fits-all product.
- ✓ **Technical expertise and support:** Ensure the supplier provides ongoing engineering support to help keep assets running and to minimise downtime.



We need to understand the customer's process first, then the equipment, then the solutions. Only then can we recommend the product or application with 100% certainty.

Kalyan Roychowdhury
Regional Business Development Manager,
Henkel APAC

CHAPTER 4.

HOW TO MEASURE SUCCESS AND PROVE ROI

Measuring how well wear protection products perform can be tricky. There are so many factors at play, like the type of materials used, how the equipment is operated, the conditions of the site – and, of course, application correctness. That’s why starting with a clear baseline is important.

ESTABLISHING A BASELINE

First things first, you need to document how long components last without the wear protection solution. Make sure this baseline reflects real operating conditions rather than ideal scenarios. Having a solid baseline helps you measure the actual impact of wear solutions and set realistic expectations for efficiency and reliability improvements.

VALUE TO COST CALCULATION

Use the results from these trials to do a value-to-cost calculation. This means looking at how much downtime and maintenance costs drop compared to what you spent on the wear protection solution.

DOCUMENTED TRIAL REPORTS

Next, conduct documented trials over a set period, such as 4, 6, 8, and 10 weeks. These trials are essential for showing how effective the wear protection products really are. For instance, if a new product lets you extend maintenance intervals, calculate the savings. You might find that instead of needing two people for two hours every four weeks, you can stretch that to every fourteen weeks, saving around \$50,000 USD per year.

CONTINUOUS FEEDBACK AND ADAPTATION

Remember, success isn’t a one-and-done deal. Keep the lines of communication open with your wear solution supplier. Regular check-ins, especially after a few months, help you see how the product is performing and make adjustments as needed.

THE CENTRE OF EXCELLENCE PERSPECTIVE

From the Centre of Excellence side, while measuring success can feel complicated, it’s essential to get the right data points. Running trials and gathering case studies helps build a solid reference for future decisions. If you do hit an obstacle with downtime, investigate it thoroughly and systematically—check how the product was applied and whether the team followed the right specs. Often, it’s not the product that’s the issue, but how it’s applied on-site.

CASE STUDY:

FAST-TRACK CHUTE RECOVERY BOOSTS PRODUCTIVITY AT IRON ORE PORT

THE CHALLENGE

At a high-capacity iron ore ship loader in Western Australia, the site’s chute system was deteriorating rapidly due to constant abrasion from ore falling 6 meters at a rate of 10,000 tonnes per hour. The ceramic tile lining within the chute typically failed after just 10 weeks, requiring patching or full replacement. Replacing the chute or performing hot work introduced safety risks, required significant downtime, and incurred substantial capital and labour costs.

HENKEL’S SOLUTION

To minimize disruption and extend the operational life of the chute, Henkel’s application experts recommended **LOCTITE® PC 7218 Wearing Compound**.

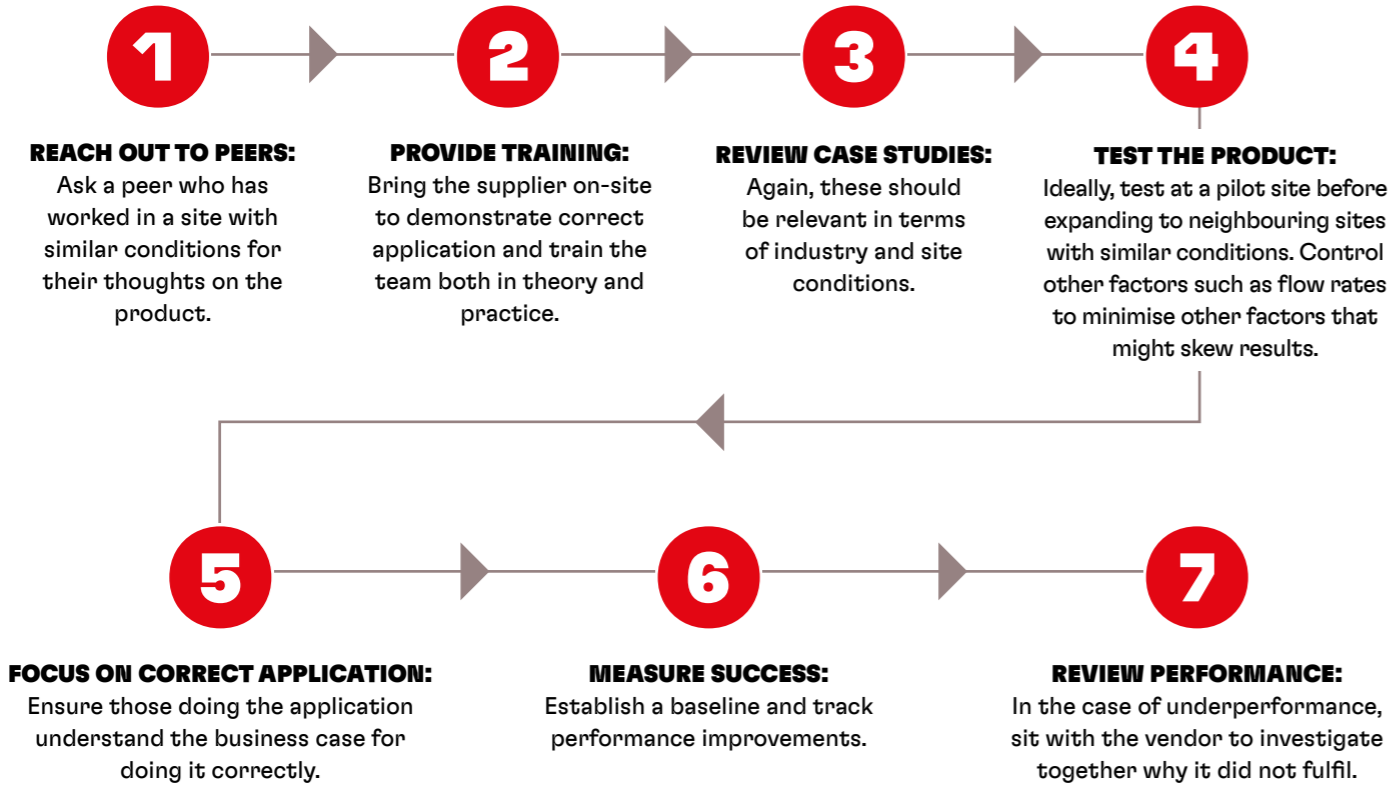
- After thorough cleaning, the worn areas between the ceramic tiles were rebuilt with LOCTITE PC 7218, a robust epoxy composite designed for high-abrasion environments.
- The repair was completed in just five hours, without the need for hot work permits or full tile replacement.

THE OUTCOME

- **Chute Life Extended:** The repair increased the chute’s service life by **an additional 10 weeks**, matching the previous replacement cycle without full overhaul.
- **Cost Avoidance:** The plant avoided the high capital expense of chute replacement, as well as related labour and equipment access costs
- **Time Savings:** The entire repair was completed quickly, reducing downtime and operational delays.
- **Improved Safety and Efficiency:** Eliminating the need for hot work reduced safety risk and streamlined maintenance approvals.



SEVEN STEPS TO SMARTER WEAR PROTECTION



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For wear protection, we rely on word-of-mouth, references, and case studies showing supplier experience, application environment, and performance outcomes. We then trial the product on-site with supplier support, apply it correctly, and measure results consistently to assess its effectiveness. The best products prove their performance very quickly.

Senior Director,
Growth, Strategy & Development, Rio Tinto

By embracing these best practices, supported by strong supplier partnerships and empowered teams, mining operators can significantly reduce risk, extend equipment life, and create more resilient, efficient operations. As the industry evolves, proactive maintenance and continuous learning will be key to long-term success.



**GET IN TOUCH**

Whether you need site-specific advice, want to trial a solution, or just have a question — Our LOCTITE application engineers are here to help.

Contact us: solutions@henkel.com

Learn more: www.henkel-adhesives.com



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