Tire and support roller resurfacing services

Cut operating costs.
Extend equipment life.

FLSmidth

WE DISCOVER POTENTIAL

Reduce your kiln costs with tire and support roller resurfacing

As your kiln ages, tire and roller surfaces may show pitting, spalling, cracking, and other wear problems. The result? Vibration, high power consumption, kiln alignment problems and short bearing life. Worst case scenario: unplanned downtime and extended outages that impact your productivity.

Resurfacing tires and support rollers helps you avoid these problems by improving mechanical stability and extending equipment life.

Key benefits

- Minimise operating costs
- Increase equipment life
- Reduce power consumption
- Cut maintenance costs

Why resurface?

Wear problems on your kiln tires and roller surfaces are inevitable as your kiln ages. But if they are allowed to continue, they will not only affect power consumption and operating costs, but can also lead to premature bearing failures, damage to tire retaining components, bases, drive components, and piers and footings.

Resurfacing can correct issues such as

- Concave/convex wear
- Rolled over edges
- Timing marks
- Taper wear
- Spalling
- Circumferential grooving

The benefits of resurfacing

Reduced energy consumption

Vibration and poor alignment and can lead to excessive power consumption, leaving you with high running costs and a greater than desired environmental impact. Case studies show that energy savings of up to 42% have been made on the running of rotary kilns through tire and support roller resurfacing.

No costly downtime

We resurface the worn faces of support rollers and tires by grinding, in-situ, while the kiln is in normal production, so you don't have to lose any production time.

Proper roller adjustment

Resurfacing allows proper adjustment of support rollers with reduced danger of causing hot bearings. We accurately measure and report the diameters before and after the resurfacing process. This makes it possible to hold a machining tolerance of 0.125 mm on the radius. Surfaces are finished to 125 RMS or better. This allows for setting the final thrust on the rollers during the process.

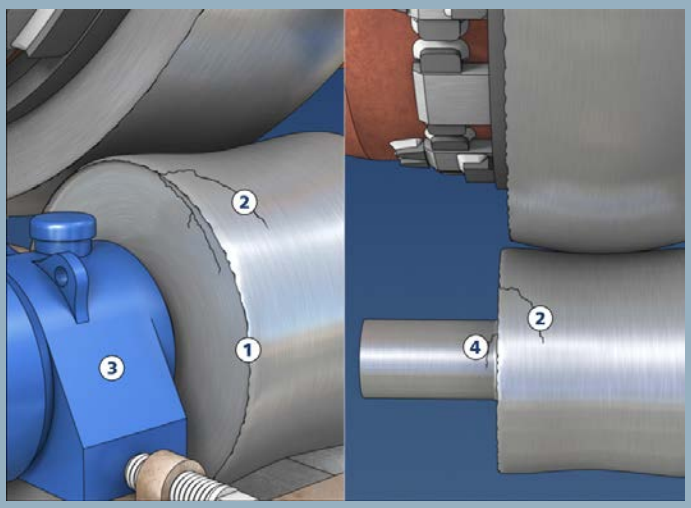
Increased mechanical stability

Rolled over edges lead to edge cracks which can propagate into the tire causing large pieces of metal to fall out or the entire face of the tire to crack. Our resurfacing process improves mechanical stability while decreasing the cost of operating the equipment.

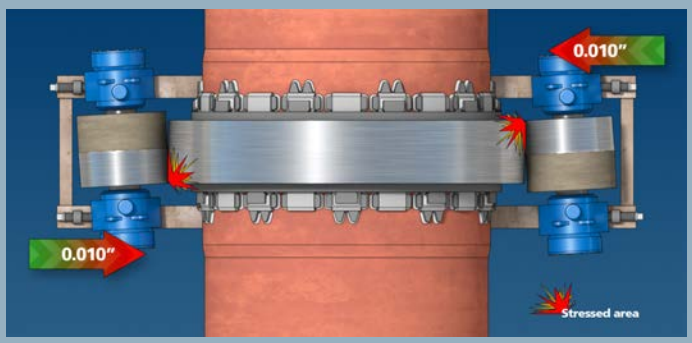
Comprehensive solutions

We use a cup grinding stone to enable the machine to sense the highs and lows as it traverses the face. In this way, difficult problems such as timing marks or other highs and lows are eliminated with minimal material loss and without risk of machine chatter.

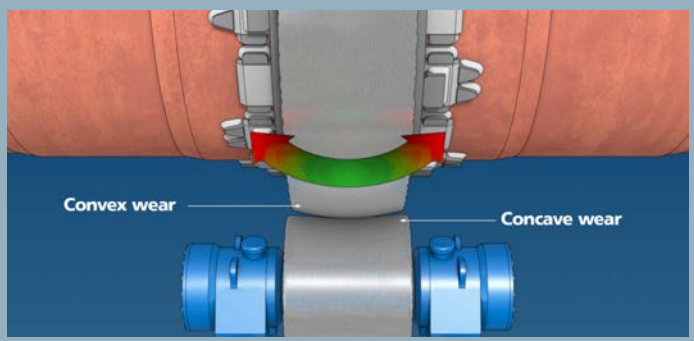
Bad alignment causes irregular face wear, leading to serious problems



1. Mushroomed edges
2. Cracking in the roller
3. High thrust loads causing hot bearings
4. High point loads causing shaft failures
5. Increased power to turn the shell, causing gear and pinion wear



Taper roller and convex roller wear



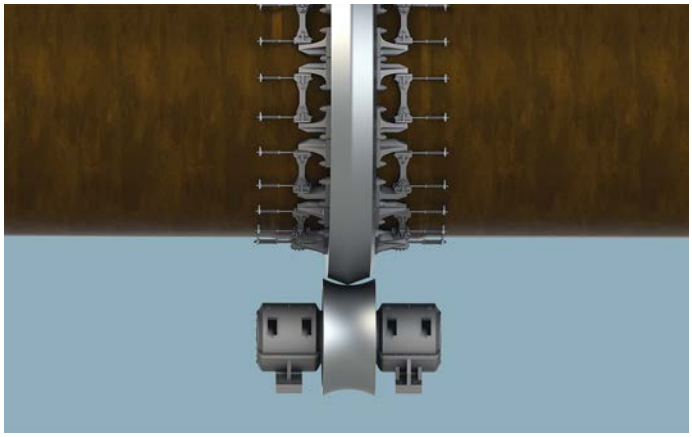
Concave roller and convex tire

Common kiln tire and roller surface problems

Concave and convex wear
Concave and convex wear results from the skewing of the roller shafts sometimes used to control axial thrust. As this type of wear continues, the contact between tire and support rollers decreases, and even more skew is required to maintain the desired thrust. This causes even more wear and, as the cycle continues, the kiln becomes more and more difficult to control. Bearing failures or serious thrust roller problems can result.

Thermal expansion and contraction during normal operation causes the tires to move axially up hill and downhill on the rollers, forcing the tire to ride high on the edges of the support rollers. This increases the loads and stresses on the metal and will cause surface spalling or lead to metal fatigue and cracking. Concave and convex face profiles prevent free axial movement of the tire on the rollers. The tire will therefore force the roller to move in the direction of the thrust, causing high bearing temperatures. Bearing failures eventually result.

Rolled over edges
Sometimes referred to as “mushrooming”, this problem may have a variety of causes. Typically, badly skewed rollers are to blame, although slope errors, pier-to-pier misalignment, material hardness and excessive loads can also produce these symptoms. The thin edge of the rolled over rim is full of cracks which, when left unattended, persistently work their way deeper into the side of the tire. Serious metal failure or entire cracked tire faces often result.



Concave and convex wear on tires and rollers

Timing marks
These horizontal or diagonal “washboard” patterns are imprinted on the rolling surfaces over a period of time by a poorly aligned gear and pinion. Too much root clearance or, in most cases, too little clearance, causes the teeth to “bottom out” and a jerky drive action results. This cycle of tooth engagement, or a harmonic of it, leads to this “washboard” pattern.

Once established, this pattern causes more vibrations. The cycle accelerates and is repeated on adjacent piers. The subsequent pounding action then quickly leads to mechanical failures. Similar “washboard” wear patterns can be caused by other drive-related causes such as torsional stiffness problems in the drive train, dual drive load sharing problems or mis-adjustment of support rollers.

Taper wear
Conical wear, or radial taper, occurs when the diameter of the tire and roller decreases faster on one side of the face. This is typically caused by the support rollers not sitting parallel to each other, or by slope errors in either the rollers or the kiln shell itself.

Spalling
This occurs when the face contact between the rolling elements has reduced to a point where the hertz pressures exceed the elastic limit of the metal. Material peels off, forming spalls, or the material work hardens, cracks and falls out in chunks. Both cases, left unattended, rapidly reduce the service life of the components.

A technical partner you can trust

A proven resurfacing process
Resurfacing is a unique process that restores the rolling surfaces of tires and support rollers. The work is done by an experienced crew with portable equipment to carry out the work in-situ and with minimal involvement needed from your team.

Two machines are used simultaneously, one on the support rollers and one on the tires. This prevents us from impressing the bad surface of one component into the newly finished surface of the other.

Our crew is experienced in dealing with kiln reactions. Resurfacing exposes fresh metal which significantly changes the thrust characteristics of the support rollers. These changes are continuously monitored during the process and adjustments are made to control the position of the kiln. At the completion of the process, the support rollers are left well adjusted for thrust, minimising the risk of future problems.

Decades of experience
We pioneered this process and therefore have extensive experience in its use. We have designed machines specifically for this purpose and provide knowledgeable supervisors who understand and control the changing behaviour of the kiln throughout.

- By simultaneously resurfacing the roller and tire surfaces, we achieve the required results with a minimum of material removal and, therefore, at lowest cost.
- We measure and report dimensions before and after resurfacing to provide quality assurance. We can therefore guarantee surface finishes by flatness, lack of taper and smoothness.
- We have a variety of machines to accommodate different face widths of tires and rollers and special situations.
- Our crews work exclusively on rotary kilns, dryers and similar equipment.
- We are experienced with all makes and sizes of rotary equipment.
- Our resurfacing service maximises the remaining service life of your equipment.

Support roller grinding

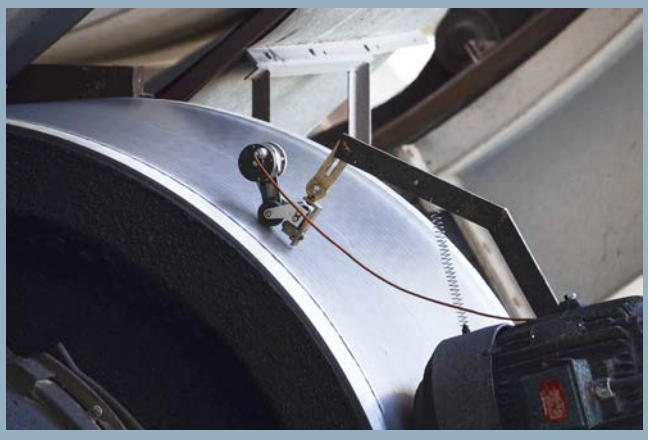
Ignoring the effects of badly surfaced or improperly resurfaced tires and rollers can be disastrous.

Get in touch to prevent unwanted costs and downtime, and prepare your kiln for sustainable productivity.

Categories of equipment we have serviced:

- Rotary kilns
- Delacquerers
- Rotary coolers
- Washers
- Rotary dryers
- Debarking drums
- Rotary furnaces
- Pelletizers
- Rotating reactors
- Coal breakers
- Rotary filters
- Granulators
- Bean conditioners
- Incinerators
- Rotary ash cylinders
- Shakeout drums
- Mill shell bearing surfaces
- Mine hoist brake drums

Thrust face grinding



Diameter measurement

Contact us

flsmidth.eco/contact

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