

# Kiln services – Resurfacing of rollers and tyres



# Improve mechanical stability and reduce costs

## Key benefits

- Reduces energy consumption
- Lowers operating costs
- Requires no downtime
- Prolongs service life
- Eliminates vibration
- Roller skew neutralized and set properly

*Diameter control*



## Measurable results

Resurfaced components improve the mechanical efficiency of your kiln:

- Energy required to turn the kiln/rotary equipment is reduced. Case studies show that energy savings of up to 42% have been made on the running of rotary kilns/rotary equipment
- We accurately measure and report the diameters before and after the resurfacing process. This makes it possible to hold a machining tolerance of 0.3 mm on the radius

## Why resurface?

Rotary kilns, dryers and similar types of equipment stay in continual operation most of the year and as time goes by, various types of wear problems occur. Tyre and roller naturally form irregular surface profiles from roller skew in addition to pitting, spalling, irregular markings and rolled-over edges.

As wear progresses, these conditions can result in vibrations, inability to control axial thrust, increased power consumption, alignment problems and reduced bearing life. Without regular preventative resurfacing, issues such as premature bearing failure and damage to tyre retaining components, bases, and drive components can occur. Rolled-over edges lead to edge cracks which can propagate into the tyre causing edge spall damage or the entire face of the tyre to crack.

Resurfacing allows for proper adjustment of support rollers and reduces power consumption. The FLSmidth resurfacing process improves mechanical stability, reduces energy consumption and lowers operating costs. We resurface the worn faces of support rollers and tyres in-situ, while the kiln/rotary equipment is in normal production – there is no costly downtime and plant operation is uninterrupted.



## Industry-leading experience

Resurfacing is a unique process that restores the rolling surfaces of tyres and support rollers. FLSmidth pioneered this process and has the greatest experience in its use. We have specifically designed machines to accommodate different face widths of tyres and rollers and special situations that might occur.

All work is completed by experienced FLSmidth service technicians, who understand and can control the changing behaviour of the kiln/rotary equipment during the resurfacing process:

- Two machines are typically used simultaneously, one on the support rollers and one on the tyres. Reconditioning removes work hardening and by working simultaneously on both components this minimizes damage of the fresh surfaces before they can work harden
- Resurfacing changes the thrust characteristics of the support rollers and allow free travel of the roller in the support bearings. These changes are continuously monitored during the process and adjustments are made to control the position of the kiln/rotary equipment
- All work can be performed while the kiln/rotary equipment is in normal production. At the completion of the process, the support rollers are left well adjusted for thrust, minimising risk of future problems

*Facet patterns on roller*

**Types of wear problems**

The conditions described below rarely occur in isolation. One may dominate, but all are usually present in varying

degrees. The simplest way to describe the situation when no one condition dominates is to classify it as an irregular face profile.

PROBLEM	DESCRIPTION	RESULT
Concave and convex wear	Results from normal skewing of the roller shafts - contact between tyre and support rollers decreases	Inability to control individual roller skew, high axial loading of bearings and potential bearing failure. Difficulty controlling axial positioning of the kiln/rotary equipment and increased power consumption
Rolled-over edges	Sometimes referred to as "mushrooming", this problem may have a variety of causes although badly skewed rollers are often to blame	Serious metal failure or entire cracked tyre faces
Taper wear	Conical wear, or radial taper, occurs when the diameter of the tyre and roller decreases faster on one side of the face	Increased drive component wear and kiln drive amperages leading to higher kiln operating costs
Timing marks	Horizontal or diagonal "wash board" patterns are imprinted on the rolling surfaces over a period of time by a poorly aligned gear and pinion	Pounding action quickly leads to mechanical failure
Spalling	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, rapidly reducing component service life



Thrust face grinding



Surfaces after machining



Concave and convex wear on rollers and tire

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