FULLER®

ONLINE CONDITION MONITORING SERVICES

FOR KILNS

MONITORING AND EXPERTISE TO IMPROVE KILN PERFORMANCE AND AVOID UNPLANNED DOWNTIME

The kiln is at the heart of the cement plant. Your productivity, product quality and sustainability all rely on optimal kiln performance. Unplanned downtime is catastrophic. Yet most kilns operate with just a few isolated sensors and inspections every 2 – 3 years, which doesn't give you enough information to optimise performance and get ahead on kiln maintenance.

Online condition monitoring services for kilns utilise multiple sensors and our kiln experts to provide real-time monitoring and analysis of the kiln crank, kiln shell ovality, axial balance, and more. Sensors provide continuous data that is forwarded automatically to our 24/7 Global Remote Service Centre, where our network of specialists analyse it and make recommendations to help you.

KEY BENEFITS

01

Increase uptime and output.

02

Gain fuel and power savings.

03

Lower labor costs by transforming unplanned shutdowns into planned ones.

04

Extend equipment lifespan with improved preventive maintenance.

05

Reduce premium costs and services by having the right spares on site at the right time.

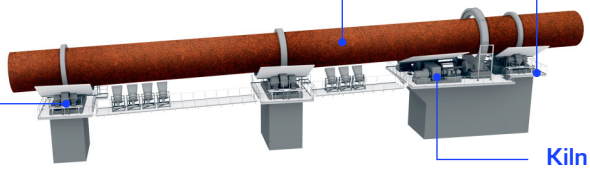
06

Return of investment: 3 months

KILN: LEVEL 1 PACKAGE

CemScanner™ data analysis*
- Detection of abnormal Kiln shell temperature
- Live ring migration monitoring (if available)
- Correlate Kiln shell temperature for root cause analysis

Hydraulic thrust device monitoring
- Kiln axial floating and cycles
- Kiln axial load
- Health of hydraulic system



Bearing Monitoring
- Identify overload
- Identify improper lubrication
- Analysis of bearing temperature trend
- Root cause analysis on hot bearings

Kiln drive monitoring
- Kiln drive power consumption

**Analysis through Bomgar remote connection*

KILN: LEVEL 2 PACKAGE

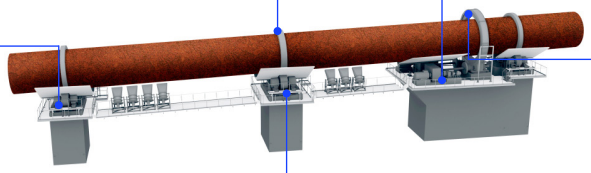
Kiln Shell Ovality

Monitoring based on Live Ring Migration
- Prolong lining life and reduce risk of kiln shell cracks
- Control kiln heating up process

Kiln drive vibration* * *
- Girth gear misalignment
- Detection of reduced tooth root clearance
- Detection of teeth failure

Kiln Crank

Monitor supporting roller deflection
- Kiln Shell
- Live ring
- Supporting rollers



Girth Gear Runout* *(optional)
- Measures continuously the axial and radial run- out
- Early detection of Gear Misalignment
- Reduces risk of premature wear or failure

Axial Balance* * (optional)
- Monitor thrust bearings temperatures
- Monitor thrust direction of individual supporting roller
- Full overview of axial balance

*** For Fuller kilns only. Non-Fuller kilns case-by-case* **** *Kiln Gear Box & Drive Motor are not included*

Two monitoring packages

These services come in two packages – Level I and Level II. Level I is based on existing signals and will help you improve wear life and identify the root cause of many kiln problems so that you can react quickly.

The Level II package uses additional sensors to continuously monitor kiln crank, kiln shell ovality, kiln drive vibration and girth gear runout. With this package, most of the well-known measurements from a Hot Kiln Alignment (HKA) will be monitored all the time – enabling you to schedule the HKA when it is most needed. And you get continuous insights that were not previously available.

Taking it to the next level - root cause analysis

With the Level II service package, extensive root cause analysis ensures that small problems don't have the opportunity to escalate into failures. These services help to:

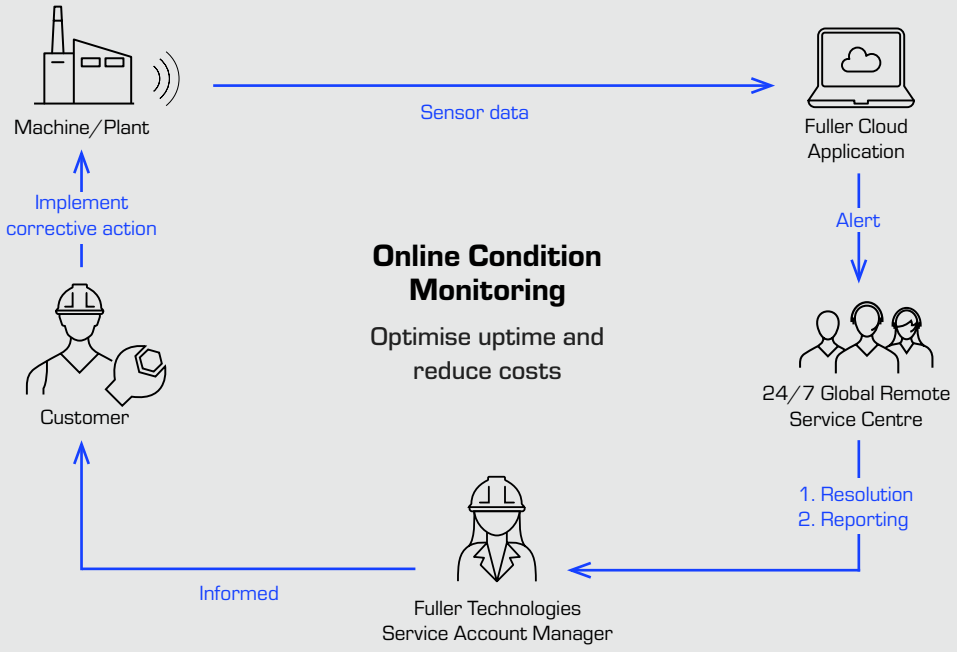
- Extend the life of rotating parts
- Improve the life of lining and kiln shell
- Avoid kiln shell constriction and reduce stress
- Avoid girth gear breakdown
- Identify alignment issues
- Stabilise bearing temperatures
- Reduce power consumption

Analyse, report, recommend

With both Level I and Level II packages, the process is the same. When alarms/events indicate action needs to be taken, a case is created and evaluated by FLSmidth experts. We then deliver critical insights and recommendations for maintenance, indicating both what needs to be done and when.

You also get regular Asset Health reports summarising all opened cases/ events, together with a summary of recommended actions for each case and actionable recommendations to improve uptime.

HOW DOES OCMS WORK?



Signals from monitoring systems installed on your equipment are sent securely via the Cloud to our Global Remote Service Centre. Here, your equipment is monitored continuously, and our expert advisors are notified of any alarms/events. These experts will further analyse the data and relay our recommended preventive or corrective actions to your maintenance team. Your customer success manager will always keep you informed, ensuring a timely response to any abnormalities to avoid escalating problems.

FULLER TECHNOLOGIES

fuller-technologies.com

C 12-25 000-102 ENG