



Customer Success Stories

We pioneer motion

The ideal condition monitoring solution

Quick & easy setup - immediate failure identification

Lehigh Hanson was not satisfied with the existing once-per-month condition monitoring schedule for the critical machines at its facility in Union Bridge, Md. Because unplanned downtime needs to be detected as early as possible, the cement manufacturer opted for Schaeffler's award-winning OPTIME wireless condition monitoring solution. This consequential decision quickly paid off: Shortly after the first sensors were installed, OPTIME reported a potential problem with a cooling fan.

Preventing this one unplanned shutdown alone saved Lehigh Hanson approximately 15,000 US dollars.

Customer benefits

- Quick and easy installation of OPTIME components.
- Data is easy to read and understand – no expert knowledge required.
- Improved safety for employees – wireless sensors eliminate the need to access hard-to-reach machinery.
- Cost-effective solution for comprehensive monitoring of assets.
- Permits long-term planning of maintenance measures, personnel requirements and spare parts procurement.
- Unplanned downtime is no longer an issue for monitored machines.

medias.schaeffler.de/en/success-stories

Lehigh Hanson

HEIDELBERGCEMENT Group

Customer

Lehigh Hanson, Part of
HeidelbergCement Group

Sector

Cement

Application

Cooler fan

Solution

Condition Monitoring

SCHAEFFLER

What drives our customer ...

Challenge

Lehigh Hanson has been supplying cement, aggregates, ready-mix concrete, asphalt and other building materials to customers throughout North America for more than a century. Union Bridge is the company's largest cement plant operating in the region.

A typical cement manufacturing process involves crushing, sizing and mixing inputs such as limestone and clay to create the raw material that is then ground in grinding mills and heated in a rotary kiln to temperatures as high as 1450 °C. The resulting material that leaves the kiln is known as “clinker,” which is ground again to a fine powder ...

which we know as cement. Unplanned shutdowns are very costly in the cement-making business.

My greatest worry is an unplanned shutdown of the plant. Up to now, we had a service provider monitor the machines and evaluate the data. Unfortunately, some failures were not detected by their system. Our clinker cooler fans are a critical part of our operation,

says Carmelo Hernandez, Maintenance Manager.

This is why the Lehigh Hanson maintenance manager was seeking a solution that a) would provide early insight into the health of the machinery, and b) could be accessed automatically by maintenance personnel. Accordingly, Lehigh Hanson turned to Schaeffler.



Lehigh Hanson's cement plant in Union Bridge, Maryland, USA



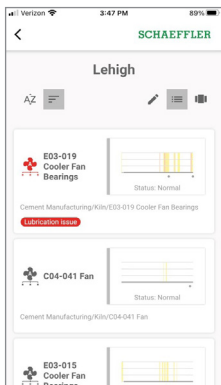
Technical information for the fan

Type	Clinker Cooling Fan
Airflow rate supply air	21.25 m³/s
Speed (or pressure)	1149 rpm
Size (height)	5.25 feet
Weight	1750 kg
Temperature	38 °C

What Schaeffler has to offer ...

Solution

The experts at Schaeffler recommended their award-winning OPTIME condition monitoring solution. This scalable system consists of wireless sensors, a cellular gateway and digital services that are based on proprietary Schaeffler algorithms. A pilot project at Lehigh Hanson's Union Bridge facility involved installing ten OPTIME sensors and a gateway. Shortly after installation, a warning of impending bearing damage to the facility's E03-019 cooling fan was displayed on the OPTIME app.



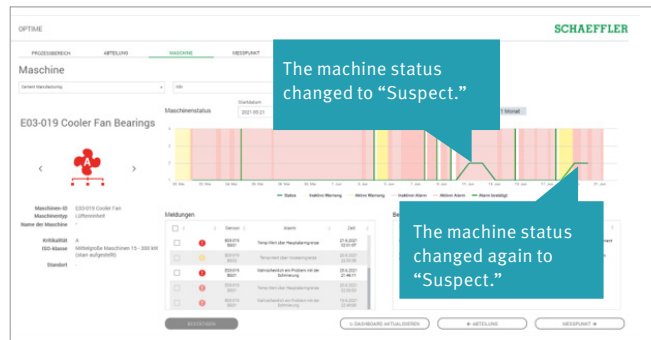
As shown in the OPTIME app on the customer's smartphone: The status of cooling fan E03-019 changed from "normal" to "suspect."

Warning level

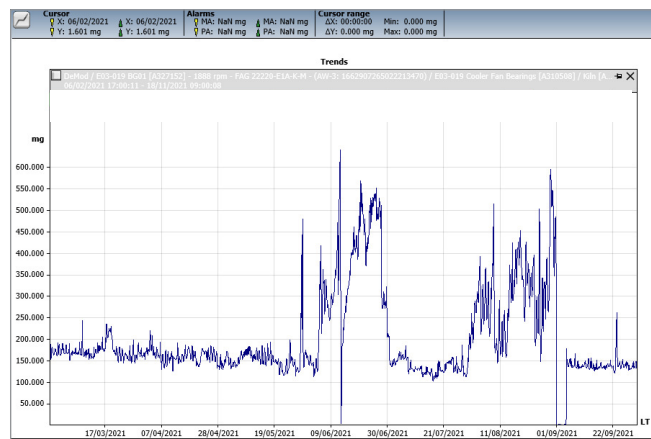
- ① = Normal
- ② = Suspect
- ③ = Warning
- ④ = Severe

Lehigh Hanson confirmed the issue after an inspection: A spherical roller bearing housing was cocked, which caused the temperature to rise. The problem was corrected and, for a short period of time, the values of the cooling fan moved within the normal range. After about two months, however, another warning message appeared on the same fan. This time, the maintenance manager contacted the Schaeffler experts directly. They performed an in-depth analysis using OPTIME's ExpertViewer* tool. As a result, a defect on the outer ring of the previously cocked bearing was detected. The issue was quickly addressed by the maintenance team, and an unplanned shutdown was avoided.

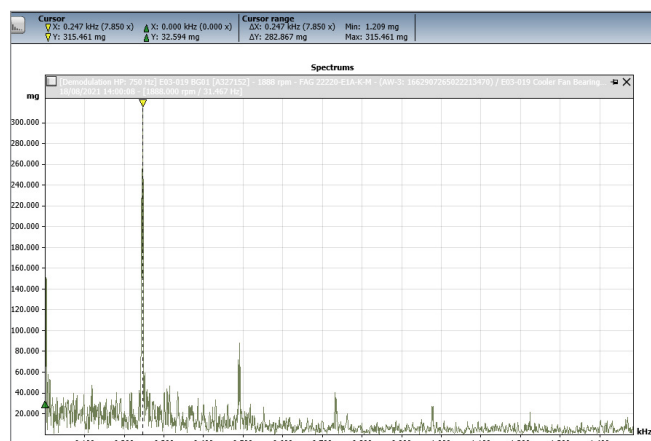
*OPTIME ExpertViewer – developed on the basis of Schaeffler's more than 25 years of vibration analysis experience – is an add-on tool that enables a precise analysis of problem severity and root causes. ExpertViewer is an optional, software-based digital service tool that customers can use themselves.



Customer view: The OPTIME Dashboard shows two separate instances where there was a change in the machine's status.



OPTIME ExpertViewer: In a depth analysis, the envelope trend shows the amplitude increase due to bearing damage for each case.

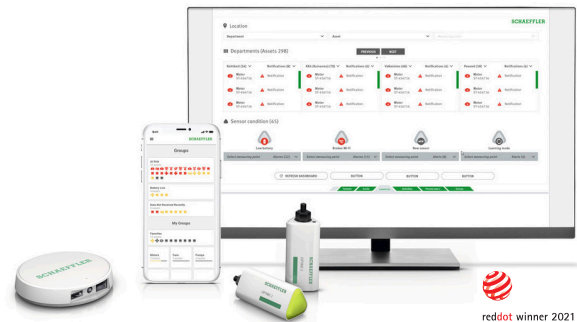


OPTIME ExpertViewer: Envelope spectrum with bearing damage frequency and the associated harmonics.

What Schaeffler has to offer ...

How OPTIME works

OPTIME's sensors monitor the machinery and equipment at the customer's site. The gate way receives the data from the sensors and transfers it to the Schaeffler cloud. OPTIME automatically detects problems, issues the appropriate alarms, and provides information about the possible cause of the problem. Expert condition monitoring on the part of the customer is not required, since this knowledge is already fully integrated into OPTIME in the form of Schaeffler know-how. OPTIME essentially provides customers with an expert analysis that has been integrated into the Digital Services.



Schaeffler OPTIME wins the Red Dot Award 2021 in two categories

OPTIME sensor specifications

Vibration bandwidth	OPTIME-5: 2 Hz – 5 kHz
Calculated parameters	7
Sensor commissioning	NFC (Near Field Communication)
Communication	Wirepas Mesh (2.4GHz ISM Band)
Measurement cycle	Parameters: every 4 h Time waveform: every 24 h

What's special

After the pilot phase, Lehigh Hanson has now installed 100 sensors and is particularly enthusiastic about the service. In addition, the maintenance department also plans to use ProLink CMS in the future. This multi-channel condition monitoring system is preferred for machines with variable operating conditions and harsh ambient conditions, such as surface temperatures of more than 70 °C.

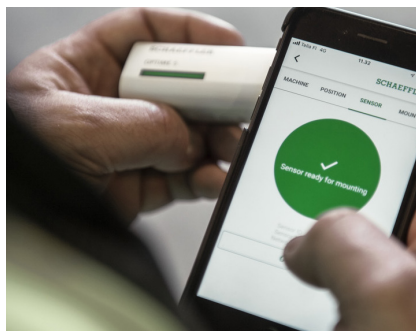
7 selected parameters based on Schaeffler's decades of bearing expertise and condition monitoring know-how

>100

Schaeffler OPTIME sensors have been installed throughout the cement mill



OPTIME is quickly and easily installed.



OPTIME sensor is provisioned.



OPTIME has identified bearing damage.

What our customer saves ...

Costs of planned downtime

Repair costs	\$3,500
Personnel costs	\$1,200
Material costs (e.g., bearing)	\$4,500
Production loss	\$90,000
Total costs	\$99,200

Costs of unplanned downtime

Repair costs	\$6,500
Personnel costs	\$4,250
Material costs (e.g., bearing)	\$4,500
Production loss	\$255,000
Total costs	\$270,250

What our customer says ...



I never thought that the installation of 100 sensors would be so easy and fast. I planned three days for the installation, but the work for this was done after 14 hours. OPTIME was so easy to set up, I sent the Schaeffler employees home earlier than expected!

I am thrilled that technology, packaging and pricing have finally come together to make a solution like OPTIME possible – and easily financially justifiable.

Carmelo Hernandez
Maintenance Manager, Lehigh Hanson,
HeidelbergCement Group

Customer

Lehigh Hanson Inc. is a leading supplier of construction materials in North America. Its core activities include the production of cement and aggregates as well as ready-mix concrete, asphalt and other downstream products. Lehigh Hanson Inc. is part of the HeidelbergCement Group, one of the world's largest manufacturers of building materials.

Why Schaeffler?

- Technical expertise
- Friendly and knowledgeable customer service
- Quick and easy installation

Why this specific solution?

- Precise machine condition data
- Easy, intuitive operation
- Automated learning mode