

APPLICATION NOTE

They are better together— Ti400 Infrared Camera and Fluke 805 FC Vibration Meter

If a tree falls in the forest . . . it makes a noise, whether anybody's there to hear it or not.

Just like that fabled tree, machines in trouble provide telltale evidence to warn of impending problems—if you just know how to look and listen. Two of the most useful indicators are temperature and vibration. Most mechanical components emit a certain amount of heat and vibration in the normal course of operation. But excessive heat, cold or vibration can tip you off to underlying problems, so you can fix them before they lead to breakdown and bring production to a halt.

New test tools such as the Fluke Ti400 Infrared Camera and Fluke 805 FC Vibration Meter are available to help measure heat and vibration and the 805 FC can help interpret the data. They tell you what the underlying problem may be and guide you in making repairs.



Trouble heats up

An abnormally hot or cold spot or an unusual thermal pattern on process equipment often indicates an emerging problem. This makes thermal cameras, which capture two-dimensional images of the apparent surface temperatures of objects, useful tools for regular predictive maintenance of mechanical, electrical and other equipment. With thermal imaging you can discover and diagnose various issues including high-resistance electrical connections that impede airflow, bearing issues on motors and tank levels, and many other mechanical problems.

In a major Florida brewery, scanning with a Fluke infrared camera revealed that the gearbox of a bottle labeling machine was running hotter than normal – nearly boiling hot. A physical inspection showed the box was filled with water, not lubricant. A damaged seal had allowed the water in. A breakdown could have shut down the bottling line.

One way to prioritize infrared scanning is to begin with the critical assets whose failure would threaten people, property or product. Then determine what conditions add stress and monitor those assets more frequently. For example, the

sludge and particulates found in many processes put extra stress on motors affecting bearings, windings and insulation. This stress can show up as heat detectable by a thermal imager. Such motors should be scanned for frequently.

What to look for

Use your thermal imager to look for hot and cold spots, as well as other anomalies. Be especially aware of similar kinds of equipment operating under similar conditions, but at different apparent temperatures. Such deviations might signal a problem. A good approach is to create a folder for each critical equipment with a description of the asset and the location in Fluke Connect Asset. Each time you inspect a piece of equipment you or any other team member who has been given access, saves a thermal image or measurement data to that equipment folder, allowing you and your team to track and monitor the equipment condition over time and getting instant access to historical data – all from one location. Now maintenance technicians can easily do a side-by-side comparison from previous inspections to help determine whether a hot spot or cool spot is unusual and if any planned maintenance is

required. This keeps your equipment running longer, saving you time and money and reduces the risk of unplanned downtime.

When vibration shows a problem

Vibration can be normal in machine operation—or it can be a sign of trouble. Most industrial devices are engineered to operate smoothly and AVOID vibration, not produce it. In electric motors, rotary pumps and compressors, fans, and blowers, low vibration is the ideal. In these machines, vibration can indicate problems or deterioration in the equipment.

But how can the plant maintenance professional tell acceptable, normal vibration from the kind of vibration that requires immediate attention, to service or replace troubled equipment?

Use vibration to screen machine health

Unchecked machine wear can quickly damage equipment, cause safety problems, and degrade plant working conditions. In the worst cases, machine faults can knock equipment out of service and halt plant production that cuts into the bottom line.

When machines are screened, vibration can be used in a preventive maintenance program as an indicator of machine condition, and you can target remedial action before disaster strikes. This gives maintenance staff time to schedule repairs and acquire needed parts. Increased maintenance intervals mean machine life is extended and maintenance can be scheduled by need. Peace of mind builds confidence in maintenance schedules, budgeting and productivity estimates.

The hand-held Fluke 805 FC Vibration meter measures machine vibration, bearing impacting, and bearing temperature, which gives the maintenance technician critical information about the machine health and warning of bearing failures in a wide variety of mechanical equipment, including motors, pumps, fans, blowers, compressors and more. Work order history allows you to create unique folders for individual machines, storing historical inspection data that can be accessed later by your team. This provides side-by-side comparisons of previous measurements so any accelerated trends of degradation can be identified to help determine how quickly a repair is needed or if it can be delayed to a more convenient time. Trending vibration readings over time will help you to know which machines need to be scheduled for repair before a simple bearing failure leads to the loss of the shaft, loss of the machine, or loss of production.



Instead of complicated vibration analyzers that require an experienced vibration expert to analyze complex waveform data, the vibration meter is a tool that a maintenance technician with no formal vibration analysis training can use to screen the many machines in the plant. The Fluke 805 FC quickly screens vibration in order to let the user know which machines are healthy and which ones need repairs.



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