

Infrared thermography: part of an effective preventive maintenance strategy at Weyerhaeuser

Application Note

If you can use a digital camera, you can learn to operate the Fluke Ti30 thermal imager. While the images from the Ti30 may not make it into the family photo album, they could very well save your business thousands of dollars when integrated into your overall preventive maintenance strategy. Just ask Dave Feniak at the Drayton Valley, Alberta, location of Weyerhaeuser Co., one of the world's largest integrated forest products companies.



Preventive maintenance applications for the Fluke Ti30 Thermal Imager are plentiful in an industrial environment such as this Weyerhaeuser location in Drayton Valley, Alberta.

Feniak, the sawmill's electrical maintenance supervisor purchased the imager and, after some basic training on its use, went into the plant and found a problem. A big problem.

"We have been doing IR (infrared) scans routinely on a six- to nine-month basis since 1992 or so, and we usually find very few problems. I was looking at bearings in the planer mill and noticed a very hot spot in the far distance," Feniak recounts.

The Ti30 has a built in laser pointer, and once Feniak turned it on he found that heat was being generated about 150 feet away from the sawmill trim-saw motor.

"Taking the camera right over to the motor we saw the motor windings were at 90 °C (194 °F)," he says. "We did amp checks and found a severe imbalance between phases. This was on a Thursday, so we got our spare motor out and installed it the next morning on the maintenance shift, with no downtime. If the motor had failed on shift the cost would have been approximately \$30,000 for the downtime, plus the repairs would have been more expensive."

Weyerhaeuser's \$14,000 investment quickly paid for itself. And it has certainly helped to legitimize the concept of preventive maintenance at the sawmill.

"Our electrical department is just starting to build a predictive maintenance program," said Feniak. The company uses an outside contractor for infrared (IR) scans on a routine basis. Between IR scans Weyerhaeuser uses a single spot temperature gun, but diagnosis of problems is limited, Feniak says.

"Using the Ti30 we can quickly and easily see details of the problems," said Feniak. Our sawmill is constantly pushed to be faster and we target increased reliability. Using this tool has already shown us problems in early stages, allowing us to add oil to a gear reducer or replace a fan on a motor before the problem got worse."



In addition to spotting problems, thermal imagers are useful for validating that repairs have been effective.

These measures give Weyerhaeuser the time it needs to plan, schedule and make repairs before equipment fails, avoiding major breakdowns and costly downtime.

Studies show that a planned repair job typically takes only half as much time as an unplanned job. In his book, *Plant Engineer's Handbook*, Keith Mobley links the following benefits to preventive maintenance:

- Maintenance costs—down by 50 percent
- Unexpected failures—reduced by 55 percent
- Repair and overhaul time—down by 60 percent
- Spare parts inventory—reduced by 30 percent
- 30 percent increase in machinery mean time between failures (MTBF)
- 30 percent increase in uptime

And for the typical manufacturing plant, a 10 percent reduction in maintenance costs has the same bottom line impact as a 40 percent increase in sales.

The technology behind the Fluke Ti30 thermal imager is infrared thermography, which detects the infrared electromagnetic energy emitted by an object and converts it into a signal that produces a color image on the camera screen for immediate viewing. The image also can be stored for further detailed analysis.

According to Fluke Electronics Canada sales representative Ken Reeves, the unit's software helps users take area measurements and then print a report with images and annotations to use as supporting documentation. That can be particularly useful in dealing with insurance underwriters, Reeves adds.

"It helps to have the thermography study in your preventive maintenance report so the insurance underwriter has proof that a problem was fixed and that the plant will stay up and running. If your report shows you made the necessary repairs, the insurance company will have no problem covering downtime expenses," Reeves says.

Reeves encourages purchasers to take advantage of the two-day training that comes with the unit. Training covers technical nuances such as conduction and thermal dynamics. Designated technicians completing the training can then show others at the plant how to become effective with the device.

"One mill employee took the training at Snell IR, primarily to become familiar with image analysis," said Feniak. "Because the imager itself is quite simple to use, we are training ourselves in-house on how to operate the tool and capture images."

As Feniak's experience shows, adding thermography to a preventive maintenance program can significantly improve both the reliability and efficiency of plant systems. Feniak suggests a good way to investigate the usefulness of a thermal imager is to ask a Fluke representative for a demonstration and spend twenty minutes with it out in your facility.

"Since 1992 we have had a reputable contractor scan our site every nine months, and our faults continue to decrease each year," said Feniak. "Even so, we found several interesting warm spots using the Ti30 that we were able to correct before they became a problem. The opportunity for us is that we can scan every item in our plant more frequently, not just the critical points on our contractor's list every nine months. We can also do in-house PM (preventive maintenance) on more equipment than we currently do with a contractor."

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