



Nordmann's hydrophonic acoustic sensor system can be installed in nearly any type of machine tool, such as the gear shaping machine pictured here at a major European transmission manufacturer.

Nordmann Tool Monitoring

Saves on Scrap, Tool Wear and Breakage

Listening to your gear manufacturing process can often tell you when things are going wrong. When tools begin to wear, an operator can often hear the problem before he sees it.

However, by the time an operator hears it, it's probably already too late. If the tool has become worn down, a number of bad parts have probably already been produced. In the case of tool breakage, the problem could be much worse than just a few scrapped parts—it could be expensive replacement or repair of the tool, the toolholder or even the machine itself.

Fortunately, a relatively inexpensive and easy-to-install system for listening to the machining process and catching problems early has been introduced and used successfully in the North American market.

The system, from Nordmann Tool Monitoring of Hoffman Estates, IL, uses a patented acoustic-emission hydrophone to detect tool wear and breakage. The sensor is the most sensitive on the market, says Albert Trail, Nordmann's North American sales manager. It measures mechanical vibration of a cutting or forming process by the sound conducted through a machine's coolant or lubricant stream.

When a cutting tool is new, it produces a consistent acoustic signature, Trail says. But as the tool begins to wear, the noise level rises and the signature changes. The system can be integrated with a machine's controls so that after a certain level is reached, the machine shuts down automatically, or an alarm can be set off to signal the operator.

Recently, the Nordmann system underwent a year of testing

at the spline rolling facility of a major U.S. auto manufacturer. "They got some really good results," Trail says. He explains that the facility used to experience about 40 scrap parts per machine per month, but now, because of the in-process tool monitoring, the scrap rate is down to nearly zero.

In addition to in-process monitoring, the system stores the acoustic readings for every part processed, which can be useful for SPC and other quality management systems, Trail says.

The system is easily installed in virtually any machine tool system, and it has been used effectively on spline rollers, hobbers, gear shapers and broaching machines in Europe. The system is only now beginning to be used in the United States, Trail says.

For most applications, the cost of the system is around \$8,000. According to Trail, in most cases, it pays for itself within a couple of months because of reduced scrap parts and reduced tool breakage. ■

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Tool monitoring systems from Nordmann can help detect problems before they occur, preventing expensive tool breakage like the chipped rolling die shown in the inset above.

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