

Monitoring complex extrusion machinery requires focused approach.

All manufacturing operations depend on understanding the health of their machinery in order to plan and execute maintenance effectively.

Without this information a company will not enjoy the competitive advantage that comes with maximized availability.

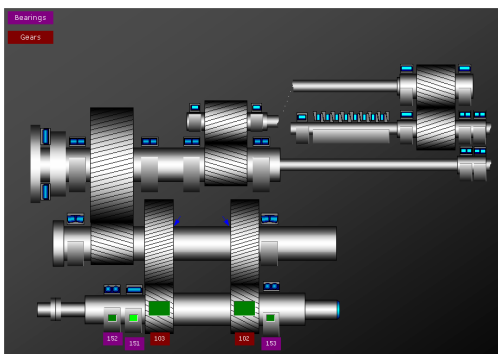
It is equally important to understand machine condition in order to avoid catastrophic failures and the collateral damage which often accompanies these unplanned events.

Gearboxes used for extruding plastic pellets are among the most complex industrial machines. With many shafts, more gears and dozens of bearings all sharing one housing, there are literally hundreds of different frequencies which must be considered when assessing machine condition.

Focus: The provider of an effective monitoring system must be familiar with the application. Some vendors attempt to cover all possible applications, and so are 'masters of none'. Others focus on certain industries (turbo machines, aircraft, etc) with very good results. MTC are the experts in extruder gearbox monitoring, *with systems installed on more of these gearboxes than all other vibration analysis vendors combined.*

It is critical that the monitoring system be specifically, accurately and thoroughly configured to the application in question.

Creating accurate, narrow band analyses

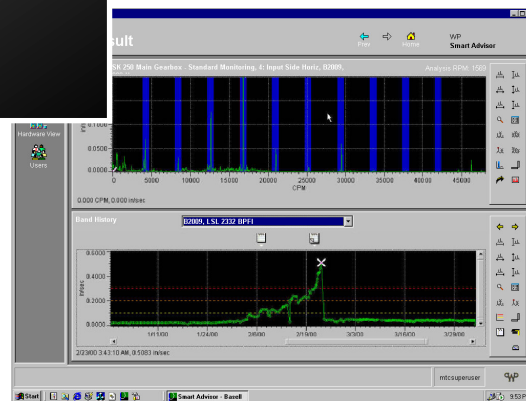


is basic to success, especially when complex machines are being monitored. Looking at the general properties of a collected spectrum may be adequate for a simple machine and measuring the gap voltage or orbit may be adequate for a sleeve bearing machine, but for a complex gearbox the individual bearing and gear frequencies must be analyzed individually and exactly.

Approach: Periodic data collection using a portable device is appropriate for some types of machinery – but not extruder trains. Too many variables change between readings for an analyst to easily determine whether changes are due to process changes (melt index, throughput, speed, etc) or machine condition. And unless the sensors are stud mounted (as opposed to magnetically mounted), it is difficult to ‘see’ signals from components buried deep within the gearbox.

Continuous monitoring is appropriate for high speed turbo machinery which can self-destruct almost instantaneously (with the attendant safety issues in addition to machine repair cost and downtime cost).

However, since extruders do not fail so spectacularly the expense of continuously monitoring all sensors is difficult to justify.



Also, continuous monitoring is most appropriate for simple DC measurements (like the gap voltage from a proximity probe) not the types of analyses that MTC performs which take time to process (waveforms, FFT, enveloped FFT, and Gear Imaging™ from accelerometer data).

On-line monitoring, in which the sensors are permanently mounted and the system collects data on a periodic basis (usually approximately every half hour), is the best fit for extruders. The data is collected often enough so that process changes may be seen in the trends, yet is still affordable. Having sensors stud mounted results in excellent data quality without needing to mount sensors within the gearbox (the exception to this is the Suprex type gearbox for which internal sensors are necessary). For most gearboxes almost the entire installation can be accomplished with the extruder running!

“MTC is the only monitoring company with personnel specifically dedicated and experienced in supporting large extruder gearboxes. They have developed a large experience base for monitoring extruder gearboxes through their alliance with Coperion.”

Benhard Wengert, Technical Services Manager, Coperion Werner & Pfleiderer

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