

What is Vibration Monitoring?

WVM

Since the invention of the wheel Vibration has been an issue. Once wheels were mounted to an axle or shaft, out of roundness and unbalance became prime concerns. As the industrial revolution arrived engineers began designing higher and higher speed machinery to serve many different purposes along with better bearings.

Human senses did the job by feel, sound and eyesight in the early days. Many people tell stories of balancing a coin on edge on a machine as a measurement of smoothness. Other stories have people using broomsticks held on the machine and against their ear to hear internal bearing sounds. It was well known even then that rough running machines soon broke down.

Technology has of course moved forward in leaps and bounds. Vibration sensors are now available that measure vibration very accurately to extremely small levels that humans cannot differentiate and allow it to be objectively and repeatedly measured helping to prevent costly breakdowns and loss of production. Historical empirical data has been gathered to provide guidelines of allowable vibration levels. (Tech Note 112 Vibration Severity Level ISO 10816-1)

With today's technology the decision to monitor the vibration of a piece of rotating machinery is based ROI (Return on Investment) and is usually very easy to justify when considering the machine repair or replacement costs along with loss of production. (See Machine Class Monitoring Field Application Note)

Two types of vibration sensors dominate the market today, Accelerometers and Proximity Probes. Accelerometers are used to measure the bearing cap vibration on rolling element bearings and Proximity Probes are used on Journal or Smooth Bore Bearings where the shaft is allowed to move within the bearing bore.

Accelerometers can now be purchased for under \$100.00 and complete sensor package ready to be connected to PLC/DCS computer systems for under \$400.00.



In essence Vibration sensors are mounted on the critical bearings and wired to the plant computer system or to a dedicated vibration monitoring system. Two alarm levels (Alert and Danger) are then set to alert the operator that maintenance attention is needed or in the case of Danger Alarm to shut the machine down to prevent failure. In some cases the Danger Alarm is wired to automatic machine shutdown.

In the case of expensive critical machinery multiple sensors may be used per bearing with each bearing of the machine train monitored. On less critical machines a single sensor may be used per bearing. On smaller motor driven equipment only the driven equipment may be monitored as the motor can inexpensively be replaced.

Today monitored rotating equipment includes pumps, motors, compressors, centrifuges, turbines, generators, gear boxes, fans, blowers, air handlers, chillers, and all other rotating machinery.

Please feel free to contact STI Vibration Monitoring Inc. for a recommendation for your machine. We will offer you the most practical and lowest cost solution suitable for your rotating equipment.