PREVENTION OF QUALITY DEFECTS AND EARLY SPINDLE BREAKDOWNS

When machining our raw parts, GEM**VM** enables us to detect machining problems caused by high vibrations at an early stage and thus to take countermeasures.

PROBLEM

During the machining of our engine blocks made from raw die-cast material, quality defects often occurred. In addition, calculated tool life was not reached and spindle damage became more frequent.

We noticed that the machining processes were sometimes subject to high levels of vibration and we sought remedies to detect these and to optimize the processes.

The extreme changes in vibration levels can cause damage within the spindle, of its main bearings. Once the bearings are damaged, the quality of the workpieces has become compromised. When damaged, the spindle needs to be repaired/replaced which in turn causes unplanned downtime and scheduling problems. This of course increases costs within the manufacturing plant.

Here the Artis GEM**VM** system has helped us considerably.

It enabled us to improve quality and avoid major damage. Tooling costs were also reduced significantly.

APPLICATION

We use a GEM**VM** system for continuous monitoring of the cutting process and spindle condition in defined limit values during the cutting process. The system immediately detects abnormal conditions and indicates problem. If the critical limit is reached, the system set an alarm for rapid stop of the machine tool.

SOLUTION

The **GEMVM** module with accelerometer sensors detects vibration over set limits, offers data to assist production management and preventive maintenance. The accelerometer sensors are suitable for working areas in machine; they detect acceleration signals in three axes. The GEMVM has simple digital I/O connections to the machine controls and can easy be included inside the machine control cabinet.

The visualization software, when needed, allows the operator and maintenance staff understand what's happening during the working process. It permits to set specific limits for each signal and to record data in order to make post process analysis. The customer can also use another software tool created by MMS to make a specific and deep data and condition analysis.

The **VisuScope** diagnostic tool included in the scope of delivery is an ideal tool for quality assurance of new machines and machines in operation. Process analyses from recorded GEMVM data will allow comparisons of machine states, the evaluation of damages as well as the condition after repairs.
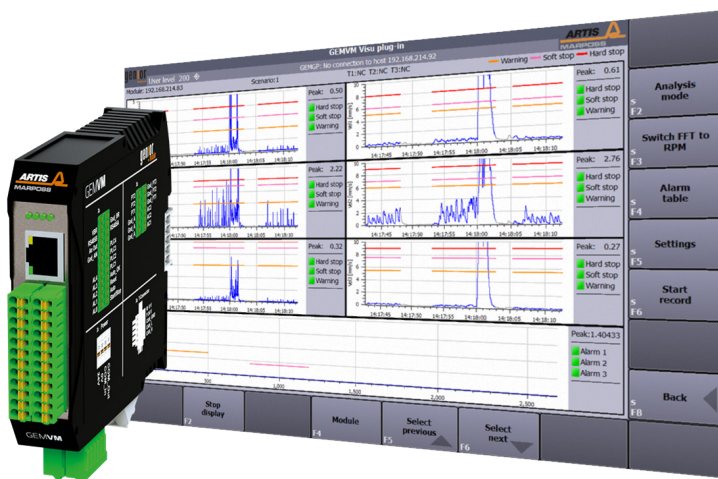
BENEFITS

✔ Avoid further damages in case of collisions or crashes due to fast alarm output for rapid stop of machine drives
✔ Predictive Maintenance by detection of anomalies such as spindle bearing damages and axis wear defects
✔ Reduction of unplanned repairs, unplanned machine downtimes and costs for scrap, tools and parts
✔ Simple process monitoring by detecting anomalies such as vibration during the machining process or unbalance of tools
✔ Avoidance/prevention of scrap and quality problems, shorter tools life and increased spindle bearing wear
✔ Prevention of repeated errors by analyzing the Black Box (event-data collection)
✔ Improving of process quality possible by analyzing the signal acceleration, velocity and FFT
✔ Modularity because of simple extension and scalable integration into GENIOR MODULAR process monitoring and visualization in MultiView

MARKET

The system can be used in different machines and systems in different industrial markets.

Therefore, it is suitable for:

• New machines: machine manufacturers (OEMs)
• Existing machines: retrofits at end-users
• Flexible test system for different machine tools
• Industry 4.0 customer projects

To find out more about our GEM**VM** system please visit the website:
https://www.marposs.com/eng/product/machine-monitoring