



**PREDICTIVE MAINTENANCE
THROUGH VIBRATION
ANALYSIS**

**75% Fewer Equipment
Breakdowns & Better
System Performance.
With Vibration Analysis***

The cost associated with equipment malfunctions (parts, labor, downtime, failures) decreases when companies move away from reactive maintenance practices and adopt a combination of preventative and predictive maintenance practices. When companies apply these cost savings across an entire facility, bottom lines generally improve.

EMCOR Services Combustioneer's (Combustioneer) vibration analysis offering utilizes an equipment database of nearly 100,000 different machines. When comparing to industry thresholds, similar equipment, and the individual history of that machine, we can identify emerging malfunctions as early as possible. This minimizes repair costs and can avoid potential failures and associated downtime.

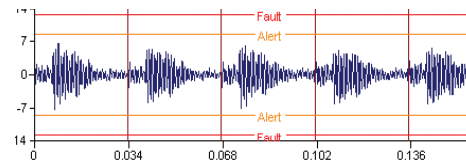
Vibration: The Problem

We've found that up to 35% of existing equipment has some level of emerging malfunction that would otherwise go unnoticed, so when motors, pumps, bearings, fans, and other similar components vibrate in ways they are not meant to, continuous and uneven wear can occur. This can cause equipment failure and downtime that interrupts operations, causing lost time, money, and productivity to the business.

Vibration Analysis: The Solution

One of the most effective ways to avoid these problems is to implement a vibration analysis program prior to vibration issues arising. Using today's most advanced vibration analysis technology, EMCOR Services Combustioneer's experts establish a vibration baseline for critical equipment. After doing so, Combustioneer measures performance regularly, watching for significant baseline deviations.

This allows Combustioneer to detect problems and identify causes early, so clients can plan ahead and schedule appropriate maintenance procedures when they are most convenient. It's one of the smartest ways to prevent major failures, minimize operational disruptions, and reduce overall business impact of equipment failures.



Facilities that adopt predictive maintenance practices in addition to traditional preventative maintenance, realize dramatic results*

75% fewer breakdowns

20% energy reduction

45% greater uptime

**We Make Buildings
Run Better.**

*Data pulled from past vibration testing, results, and analysis.

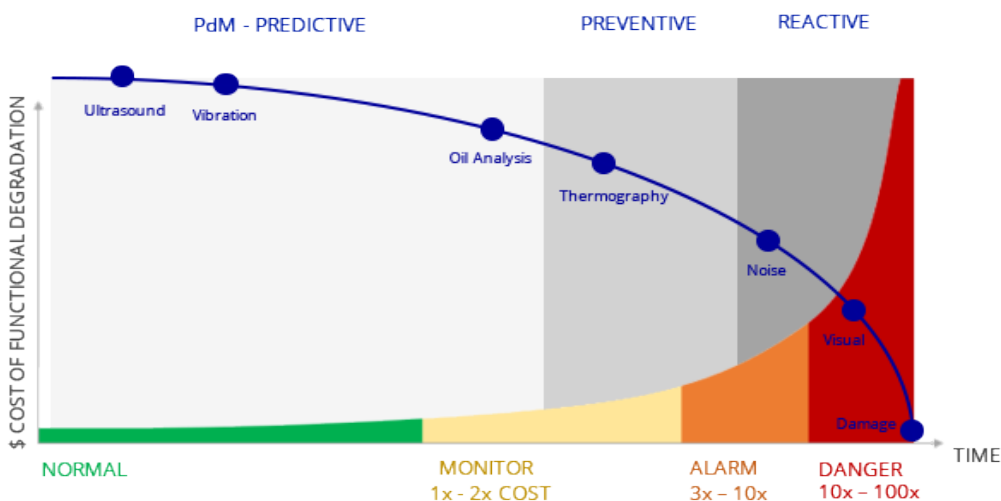


Preventive Measures, Predictable Results

A predictive approach using vibration analysis can help clients avoid:

- > Major repairs and costly replacements that result from extensive machine damage
- > Unnecessary materials waste—because when a breakdown occurs, materials often need to be discarded
- > Damage to other equipment and/or parts caused by improper operation of failing components

- > Higher energy costs that result when efficiency declines and equipment has to compensate by consuming more energy
- > Unnecessary maintenance costs from scheduled maintenance programs that require shutting down equipment and replacing parts that may still be functioning properly



With nearly 90 years of experience, EMCOR Services Combustioneer (Combustioneer) is one of the Washington, D.C., Metropolitan Area's leading full-service, single-source mechanical, electrical, and building automation and controls firms. Using today's most advanced technology, Combustioneer helps clients optimize operational efficiency and productivity by integrating a variety of systems—including air conditioning, heating, lighting, power generation, and more. Combustioneer works to help clients achieve high-performance operation, reduced energy consumption, and maximum cost savings.

WHAT CAN WE DO FOR YOU?

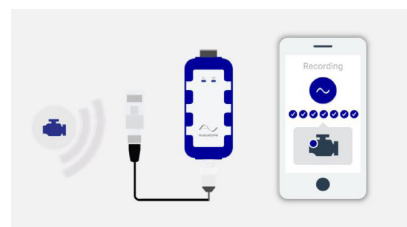
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Avoiding Problems. Embracing Innovation. Utilizing Today's Technology.

Portable Diagnostics: Combustioneer utilizes a handheld, smartphone-enabled device to collect vibration data from assets.



Continuous Diagnostics: For continuous monitoring on the most critical assets, Combustioneer uses wireless sensors installed on the machine for data collection.



Comprehensive Reports: The innovative technology can detect the slightest changes in a machine's operation and warns clients of developing malfunctions. The data collected allows Combustioneer to perform the analysis in real-time and the results are quickly delivered to clients in PDF reports.

