SERIOUS SERVICE®

It is not about our trademarks or meaningless words but only the beginning of the commitment to our clients for the last 50 years in business.

We dedicate our experience and resources so you don’t have to worry about machinery vibrations and get back to what really matters.

"PEACE OF MIND AT WORK, MORE TIME WITH YOUR FAMILY, FRIENDS AND NATURE"

Garrett Sandwell, MET, CVA, ASNT 3
CEO
Introduction to VIBES Corp.

Why work with us? Serving Canadian Industry for over 50 Years.

VIBES Corp's reputation was built and established on thousands of promises fulfilled over 50 years in business across Canada. Superior quality service, sales and training courses provided on the intelligent specialist level has been the standard and always will be since our vibration and balancing business was formed in Calgary, AB, in 1982. (Formerly Industrial Balancing Ltd. Est. 1967)

In the final real-time analysis VIBES Corp will deliver more value and peace of mind.

What do we do? Expert technical services and preventative maintenance programs using advanced instruments and tools to solve various vibration, balance and mechanical noise related problems.


What do we sell, supply, install & service?

- WEG Electric Motors.
- METALON Hi-Tech Synthetic Grease (EP 1.5 Blue)
- COOLBLUE - Inductive Absorbers & Chokes = VFD any motor shaft current bearing damage protection.
- DRIVE SYSTEM PARTS: Fans, Bearings, Sheaves, Couplings, Belts, Shafts, Misc.
- VIBRATION CONTROL, Isolation & thrust spring mounts, monitoring, trending, alarm/trip switch 24/7 machine protection

The machinery under our professional health care program = VIBES-GUARD PdM Program® are treated as if our own. We use proven technologies and methodologies along with our multi-technical and electro-mechanical (VIV, ASD, VPM, CPM, VFD, EIBD, EDM, Shaft Currents, etc.) training, skills, and experiences for total overall analysis and evaluations. When the total analyzed facts about a machine, motor or engine are known we formulate an accurate condition report and recommend the best possible solutions. We work with clients to organize necessary actions in order of urgency or budgets.

Where do we work? (Commercial Towers, Infrastructure Facilities, Industrial Plants, Lumber Processing & Marine Ports, etc.)

Our service area is mainly BC Lower Mainland and Vancouver Island. If requested we can service other areas.

Who have we worked with?

VIBES Corp service capabilities have been used and accepted by high-ranking officials in:

- other service companies
- manufacturing and processing
- engineering firms
- universities
- colleges
- hospitals
- cold storage
- power plants and dams
- sewage and water treatment plants
- government infrastructure facilities
- oil and gas
- biogas energy systems
- transportation and construction
- commercial towers
- agricultural
- mining
- ski hills
- marine-terminals & ships
- asphalt and cement
- saw mills
- pulp and paper
- research and development
- machining / fabrication
- chemical plants
- restaurants
- skytrain tunnels

VIBES Corp accepts: EFT, VISA, Mastercard, Discovery, Debit & SWIFT
We take due diligence to the highest level on all projects regardless of size or budget.

Learn About Articles

You can download educational articles from our home page at www.vibescorp.ca. Here are four recent articles:

- Electrically Induced Bearing Damage, aka Electrical Discharge Machining (EDM), Shaft Currents.
- Failure Prevention of Variable Pitch in Motion Axial Fans.

The photos below show typical projects that we have completed.

Fig 1. The failure was due to defective bearing.
Fig 2. The stainless steel guard helps prevent moisture contamination in cooling tower fan bearings (a very common problem).
Fig 3. A new fan was installed due to a complete failure of the original.
Fig 4. Shows a 200HP motor and fan repair/replacement.

Solution to Fig. 1 Replaced both Fan Bearings & New Motor Required.

Solution to Fig. 2 The Guard has prolonged the Life Span of the Fan Bearings from 3 years to over 14 years.

Solution to Fig. 3 Installed Brand New Controllable Pitch Fan & Repaired Motor.

Solution to Fig. 4 Replaced the Old Motor based on 20 years of running time and Completed Variable Pitch in Motion Fan Maintenance.
For more information & quote please visit our website www.vibescorp.ca

- WEG Low Voltage Motors
- WEG Generators
- WEG Large Electric Motors and Machines
- CoolBLUE® Inductive Absorbers

Absorb the energy caused by the VFD’s at the source...before getting to the motor.

Elimination of Shaft Currents that were causing consistent motor bearing failures at this site.

Cool Blue Inductive Absorbers installed at Pump Station
Projects completed at these locations

Onsite Balancing on 1,000 HP Grinder

Restaurant Kitchen and Fresh Air Fans Upgrade

Replaced 20HP Cooling Tower Motor

Vibration & Alignment Service Job

Tug Boat Twin Diesel Engines Vibration Analysis

Asphalt Kiln Exhaust Fan Balance Job
Projects completed at these locations

- **New Cooling Tower**
  - 40 HP motor installed

- **2 x 125 HP**
  - Kiln-Exhaust Fan Balancing & Bearing Inspections

- **Hospital Lab Hood Fans**
  - Vibration Analysis

- **Geo Thermal Pump Station**
  - Replaced Motor Bearings, Laser Aligned & Installed Cool Blue Inductive Absorbers

- **Abbotsford Pet Nutrition**
  - 450 HP Hammermill
  - Vibration Analysis, Rotor Balance & Laser Alignment Job

- **Cooling Tower emergency motor install**

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**VIBES Corp**

**Vibration Industrial Balancing & Equipment Services, Corporation**

720 - 999 W. Broadway, Vancouver, BC V5Z 1K5

www.vibescorp.ca   email: info@vibescorp.ca   Phone: 604 - 619 - 9381 (24/7)
Projects completed at these locations

Laser Alignment Job
Teck Highland Valley Copper - Processing Plant
800 HP Blower - Logan Lake

Abbotsford Waste Water Treatment Plant
Complex Vibration Solution

Large fan overhaul project

350 - 500 HP Pump Vibration Analysis Project

Vibration Control beyond the normal solutions
Projects completed at these locations

400 HP Motor & Compressor
Food Processing Plant
Vancouver
Vibration Analysis and Laser Alignment

Complete Fan Assembly Replacement

Vibration Analysis
Pleasure
Cruise
Ship Engines
Vancouver

900 HP Drill Rig RS Compressor
Vibration Analysis and Resonance Tests

900 HP Drill Rig Compressor

100 HP Woods Fan-Variable Pitch in Motion Services

60 HP Joy Fan-Controllable Pitch in Motion Services
Projects completed at these locations

- Customized motor plates and slide base installation
- 400 HP RS Compressor Coupling Laser Alignment
- 600HP Compressor System Laser Alignment Job
- Sky Train Tunnel Fan Vibration & Balance Job
- 350 HP Gantry Crane Motor & Gearbox Vibration Analysis
- Sea Water Pumps & Motors Retrofit
- Fluxdrive Magnetic ASD Conversions on 16 Exhibition Hall Fans

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Solution to Fig. 1
Replaced both Fan Bearings

Solution to Fig. 3

Solution to Fig. 2
The Guard has prolonged the Life Span of the Fan Bearings from 3 years to over 14 years.

Solution to Fig. 4
Replaced the Old Motor based on Variable Pitch in Motion Fan Maintenance.

### Vibration Severity Graph for General Rotating Machinery

**This Chart is based on ISO 10816-3**

**Amplitude**
- Displacement Mils (x.001") peak to peak

**Velocity (ips = in./sec) peak**
- Very Rough
- Rough
- Slightly Rough
- Fair
- Good
- Excellent

**Acceleration or Force of Gravity “G” (ips² = in/sec² for simplicity)**

**Reference Point**
- 1800 rpm machine/motor excellent condition

**Actual G = 32 fps/s = 9.8 m/s/s**
### Vibration Sources Identification Guide

<table>
<thead>
<tr>
<th>CAUSE</th>
<th>FREQUENCY</th>
<th>AMplitude</th>
<th>PHASE</th>
<th>COMMENTS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Unbalance</td>
<td>1 x RPM</td>
<td>Highest in Radial Direction-Proportional to Unbalance</td>
<td>Single Mark (Steady)</td>
<td>A common cause of vibration.</td>
</tr>
<tr>
<td>Defective Anti-Friction Bearings</td>
<td>Very High-Often From 10 to 100 x RPM</td>
<td>Use Velocity</td>
<td>Unstable</td>
<td>Velocity readings are highest at defective bearing. As failure approaches, the amplitude of the velocity signal will increase and its frequency will decrease. Cage frequency is approximately 0.6 x RPM x number elements.</td>
</tr>
<tr>
<td>Misalignment of Coupling or Bearing</td>
<td>1, 2 or 3 x RPM</td>
<td>High Axial Axial 50% or more of Radial</td>
<td>Often 2, Sometimes 1 or 3</td>
<td>Use phase analysis to determine relative movement of machine or bearings. Use a dial indicator if possible. Often diagnosed as a bent shaft. Can be caused by misalignment of V belts.</td>
</tr>
<tr>
<td>Sleeve Bearing</td>
<td>1 x RPM</td>
<td>Not Large Use Displacement Mode Up to 6000 CPM</td>
<td>Single Reference Mark</td>
<td>May appear to be unbalanced. Shaft and bearing amplitude should be taken. If shaft vibration is larger than the bearing, vibration amplitude indicates clearance.</td>
</tr>
<tr>
<td>Bent Shaft</td>
<td>1 or 2 x RPM</td>
<td>High Axial</td>
<td>1 or 2</td>
<td>Similar to misalignment. Use phase analysis.</td>
</tr>
<tr>
<td>Defective Gears</td>
<td>High No. Gear Teeth x RPM</td>
<td>Radial</td>
<td>Unsteady</td>
<td>Use velocity measurement. Often affected by misalignment. Generally accompanied by side band frequency. Pitting, scuffing and fractures are often caused by torsional vibrations. Frequency sometimes as high as 1 million CPM or more.</td>
</tr>
<tr>
<td>Mechanical Looseness</td>
<td>2 x RPM</td>
<td>Proportional to Looseness</td>
<td>1 or 2</td>
<td>Check movement of mounting bolts in relation to the machine base. Difference between base and machine indicates amount of looseness.</td>
</tr>
</tbody>
</table>
| Defective Drive Belts        | 1 or 2 x Belt Speed     | Erratic                                | Use Strobe to Freeze Belt in OSC Mode | Calculate the belt RPM using: \[ \text{Belt RPM} = \frac{\text{Pulley Diameter} \times 3.141}{\text{Belt Length}} \times \text{Pulley RPM} \]
|                             |                         |                                        |                        | Look for cracks, hard spots, soft spots or lumps. Loose belt. Changes with belt tension. |
| Electrical                   | 1 or 2 x Line Frequency (3600 or 7200 CPM for 60Hz Power) May appear at 1 x RPM | Usually Low              | 1 or 2 Marks Sometimes Slipping | Looks like mechanical unbalance until power is removed. Then drops dramatically. |
| Oil Whip                     | 45 - 55% RPM            | Radial Unsteady                        | Unstable               | Caused by excessive clearance in sleeve bearings or by underloaded bearings. Will change with viscosity of oil (temperature). |
| Hydraulic-Aerodynamic        | No. Blades or Vanes x RPM | Erratic                                | Unsteady               | May excite resonance problems.                                           |
| Beat Frequency               | Near 1 x RPM            | Variable at Beat Rate                  | Rotates at Beat Frequency | Caused by two machines, mounted on same base, running at close to same RPM. |
| Resonance                    | Specific Critical Speeds | High                                   | Single Reference Mark  | Phase will shift 180° going through resonance (90° at resonance). Amplitude will peak at resonance. Resonance in frame can be removed by changing rotor operating speed or by changing the stiffness of the structure. |

There are several additional detailed articles that identify more complicated vibration sources at www.vibescorp.ca titled:

1. LEARN ABOUT VIBRATION VOLUME 1: BASIC UNDERSTANDING OF MACHINERY VIBRATION
2. LEARN ABOUT VIBRATION VOLUME 2: ADVANCED VIBRATION ANALYSIS
3. LEARN ABOUT ELECTRICALLY INDUCED BEARING DAMAGE & SHAFT CURRENTS
4. FAILURE PREVENTION OF VARIABLE AND CONTROLLABLE PITCH IN MOTION AXIAL FANS
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