VIBES = 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.®**

*Formerly: Industrial Balancing Ltd. (Est. 1967 Calgary, AB) & Fan Doctor Canada Inc. (Est. 1982 Calgary, AB).*

**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 using advanced instruments and tools to solve various vibration related problems permanently!**


**What do we sell, supply, install & service?**

- WEG Electric Motors.
- COOLBLUE - Inductive Absorbers & Chokes = VFD any motor shaft current bearing damage protection.
- DRIVE SYSTEM PARTS: Bearings, Sheaves, Couplings, Belts, Shafts, Misc.

The machinery under our professional health care programs = VIBES-GUARD PdM Programs (TM) are treated as if our own. We use proven technologies and methodologies along with our multi-technical and electro-mechanical (VIV, ASD, PVM, 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 a true 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 Buildings, Industrial Plants & Ports)**

Our service area is mainly BC mainland and the Vancouver Island. As requested we can service other areas in Western Canada.

**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
- ski train tunnels

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**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.

Do we offer training?

VIBES Corp offers training courses in technologies and quality products that we use, are industry-trusted and relate to improved machinery, engine, electric motors health and performance, energy savings and preventative maintenance. Examples: Vibration Monitoring & Trending

- Laser Shaft Alignment (Ted Pater with 30 years’ experience has joined us as a consultant)
- Fan & Motor Maintenance Training
- Update International (Vibration Analyst Certification ASNT Level 1, 2 & 3) On Site & On line Courses
- Bearing Maintenance & Precision Installation
- VIBES – GUARD PdM Program (™)
- Dynamic Balancing Agricultural Machinery ON-SITE

Learn more

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

- Learn About Vibration, Volume 1 & 2: Basics & Advanced Vibration Analysis
- 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 resolved. Fig 1. The failure was due to moisture contamination. Fig 2 The stainless steel guard solved the original problem with no issues for the last 12 years. 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.
For more information & quote please visit our website www.vibescorp.ca
Projects completed at these locations
Projects completed at these locations

Sea Water Fire Pump - Shell Canada

Waste Water Treatment Plant Squamish, BC

2 x 125 HP Kiln-Exhaust Fan

Abbotsford Pet Nutrition 450 HP Hammermill

Hospital Lab Hood Fans

Geo Thermal Pump Station
Projects completed at these locations
Projects completed at these locations

- 400 HP Motor & Compressor Replacement
  Food Processing Plant
  Vancouver

- Complete Fan Assembly Replacement

- Pleasure Cruise Ship Engines Replacement
  Vancouver

- 900 HP Drill Rig RS Compressor
  Vibration Analysis and Resonance Tests

- 900 HP Drill Rig Compressor

- 100 HP Woods Fan

- 60 HP Joy Fan
Projects completed at these locations

Customized motor plates and slide base installation

400 HP RS Compressor

Sea Water Pumps & Motors Retrofit
Fluxdrive Magnetic ASD Conversions
on 16 Exhibition Hall Fans

Vancouver Convention Centre West

600HP Compressor
System Laser Alignment Job

350 HP Motors & Gearbox

Sky Train Tunnel Fan
Vibration & Balance Job
VIBRATION SEVERITY GRAPH FOR GENERAL ROTATING MACHINERY

This Chart is based on ISO 10816-3

Displacement (x.001") peak to peak

Displacement

1 mil = 25 microns

SERIOUS SERVICE™
Professional Machinery Health Care

(Fan Doctor™)

Very Rough Danger

Rough

Slightly Rough

Fair

Good

Excellent

Velocity

.1 ips = 2.5 mm/s

1.7 kHz

100 200 500 1000 1800 5000 10,000 20,000 50,000 100,000

10 G

1 G

.15

.1

.05

.01

.001

.1 G

.08 G

.06 G

.04 G

.02 G

.01 G

.001 G

1 kHz

10 kHz

100 kHz

VIBRATION ANALYSIS
VELOCITY, DISPLACEMENT, ACCELERATION
VELOCITY FOR ACCEPTABILITY - DISPLACEMENT FOR BALANCING
ACCELERATION FOR BEARING HEALTH CONDITION MONITORING

REFERENCE POINT • = 1800 rpm machine/motor excellent condition

ACCELERATION or FORCE OF GRAVITY "G" (ips² = in/sec² for simplicity)
ACTUAL G = 32 fps/s = 9.8 m/s

www.vibescorp.ca email: info@vibescorp.ca Cell: 604 - 619 - 9381
### COMMON 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>Unbalanced</td>
<td>1 X RPM</td>
<td>Highest in Radial Direction- Proportional to Unbalanced</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 40% +/- 4% of RPM.</td>
</tr>
<tr>
<td>Misalignment of Coupling or Bearings</td>
<td>1, 2, or 3 x RPM</td>
<td>High Axial</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 Bearings</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 bearings 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>Sometimes 1 x RPM</td>
<td>Proportional to Looseness</td>
<td>Check movement of mounting bolts in relation to the machine base. Difference between base and machine indicates amount of looseness.</td>
</tr>
<tr>
<td>Defective Drive Belts</td>
<td>1 or 2 x Belt Speed</td>
<td>Erratic</td>
<td>Use strobe to Freeze Belt in OSC mode.</td>
<td>Calculate the belt RPM using:  Belt RPM = ( \frac{\text{Pulley Diameter} \times 3.141 \times \text{Pulley RPM}}{\text{Belt Length}} ) Look for cracks, hard spots, soft spots or lumps. Loose belt. Changes with belt tension.</td>
</tr>
<tr>
<td>Electrical</td>
<td>1 or 2 x Line Frequency (3600 or 7200 CPM for 60Hz Power) May appear 1 x RPM</td>
<td>Usually Low</td>
<td>1 or 2 Marks sometimes slipping</td>
<td>Looks like mechanical unbalance until power is removed. Then drops dramatically.</td>
</tr>
<tr>
<td>Oil Whip</td>
<td>45 - 55 %</td>
<td>Radial Unstead</td>
<td>Unstable</td>
<td>Caused by excessive clearance in sleeve bearings or by underloaded bearings. Will change with viscosity of oil. (temperature)</td>
</tr>
<tr>
<td>Hydraulic-Aerodynamic</td>
<td>No. Blades or Vanes x RPM</td>
<td>Erratic</td>
<td>Unsteady</td>
<td>May excite resonance problems.</td>
</tr>
<tr>
<td>Beat Frequency</td>
<td>Near 1 x RPM</td>
<td>Variable at Beat Rate</td>
<td>Rotates at Beat Frequency</td>
<td>Caused by two machines, mounted on same base, running at close to same RPM.</td>
</tr>
<tr>
<td>Resonance</td>
<td>Specific Criticals</td>
<td>High</td>
<td>Single Reference Mark</td>
<td>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.</td>
</tr>
</tbody>
</table>

**NOTE:** There are several additional detailed articles that identify more complicated vibration sources at the Vibes Corp website 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**
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