

iOSS S.A.R.L.

INDUSTRIAL OPTIMUM SOLUTIONS AND SERVICES

- Industrial Services -



Intelligent asset management services



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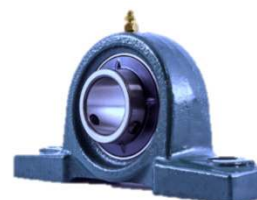
VIBRATION ANALYSIS

Main Detectable Defects

- Mass imbalance
- Shaft misalignment
- Bent or warped shaft
- Bearing wear
- Gear wear
- Structural problems
- Poor lubrication
- Electrical problems
- Resonance
- Other mechanical & electrical problems

Benefits

- **Predictability.** Give maintenance staff time to schedule required repairs and acquire needed parts.
- **Safety.** Take faulty equipment offline before a hazardous condition occurs.
- **Revenue.** Incur fewer unexpected and serious failures, helping to prevent production stoppages that cut into the bottom line.
- **Increased maintenance intervals.** Extend life of equipment and schedule maintenance by need.
- **Reliability.** Incur fewer unexpected or catastrophic failures because problem areas can be anticipated before failure.
- **Peace of mind.** Build confidence in maintenance schedules, budgeting, and productivity estimates.





LASER ALIGNMENT (COUPLING)

Main Detectable issues

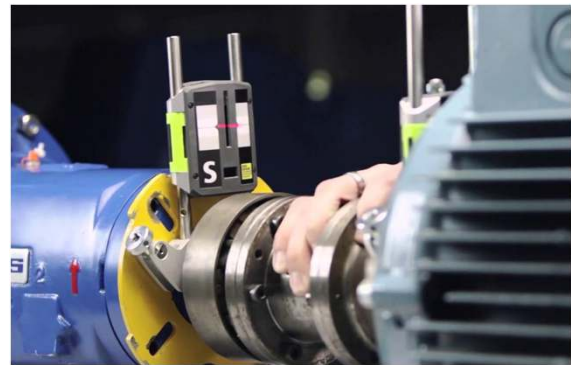
- Parallel misalignment
- Angular misalignment
- Soft foot
- Bent shaft
- Mounting problems



Benefits

- Reduced downtime
- Increased Cost-Effectiveness
- Increased operating time
- Increased productivity
- Increased production quality
- Reduced energy consumption
- Reduced leaking seals
- Reduced vibration levels
- Less bearing failure
- Avoid shaft breakage
- Reduced coupling wear

Correctly aligned machines have lower rates of expensive breakdowns and downtime.





LASER ALIGNMENT

(PULLEY/SPROCKET)

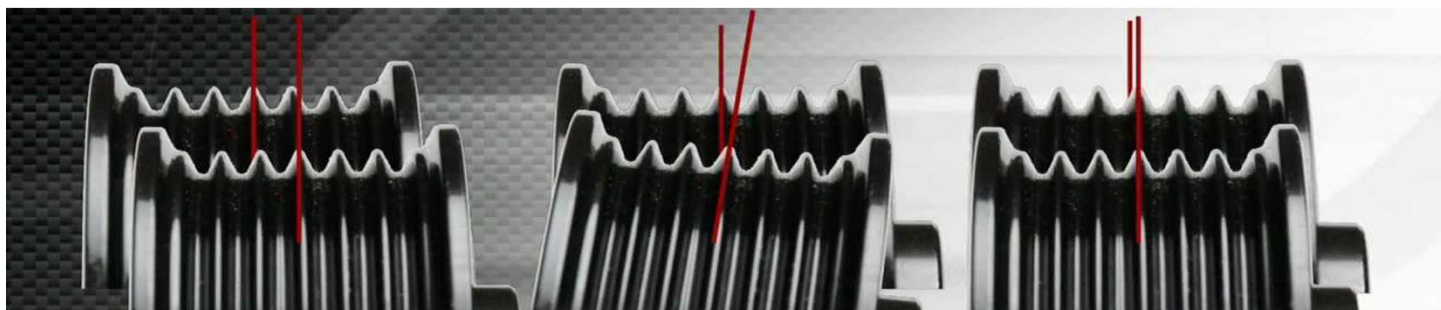
Main Detectable issues

- Parallel misalignment
- Angular misalignment
- Belt tension
- Drive belt fitting
- Worn pulleys, sprockets
- Mounting problems

Benefits

Accurate pulley and belt alignment can help you:

- Increase bearing life
- Increase machinery uptime, efficiency and productivity
- Reduce wear on pulleys and belts
- Reduce friction and thereby energy consumption
- Reduce noise and vibration
- Reduce costs of replacing components and machinery downtime





DYNAMIC BALANCING (IMPELLER/ROTOR)

Main Detectable issues

- Unbalance weight location
- Rotor sensitivity to unbalance
- Critical speeds & resonance
- Other problems excited by unbalance

Benefits

- Low vibration
- Low noise
- Increased efficiency & uptime
- Increased operator safety
- Increased bearing life
- Reduced structural stress
- Reduced operating cost
- Increased productivity



Impellers to be balanced should be clean from contaminants, all parts should be tight and alignment problems solved prior to starting a balancing job.

Balance quality grades are categories which rotors are classified. The grades begin at G-0.4 and progressively increase at a factor of 2.5. Each increase in quality grade results in greater balance tolerance. Rotors such as high-precision grinding machine spindles may be classified as G-0.4, whereas, general machinery components such as rubber covered idler rolls may be classified as G-6.3. Only the lowest four quality grades are typically used in balancing. They include G-0.4, G-1.0, G-2.5, and G-6.3.



THERMOGRAPHY ANALYSIS

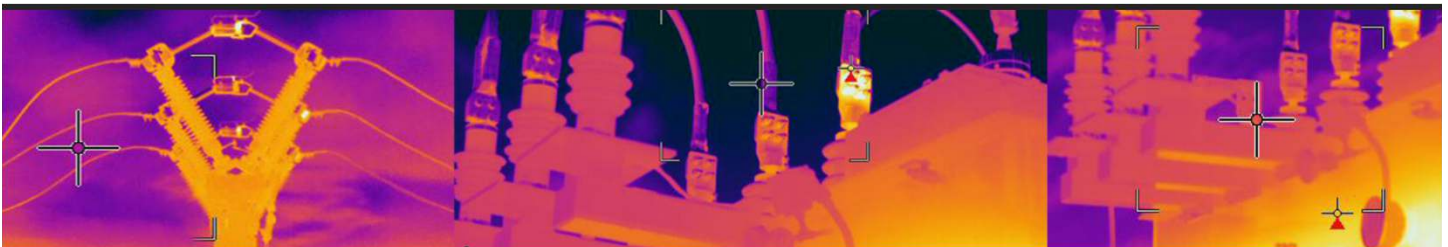
(ELECTRICAL/MECHANICAL/BUILDING/STEAM)

Main Detectable issues

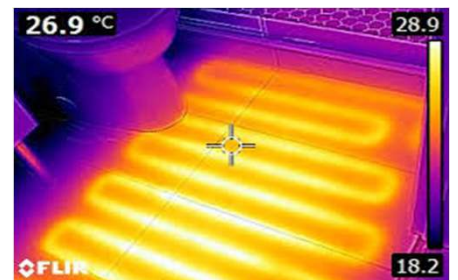
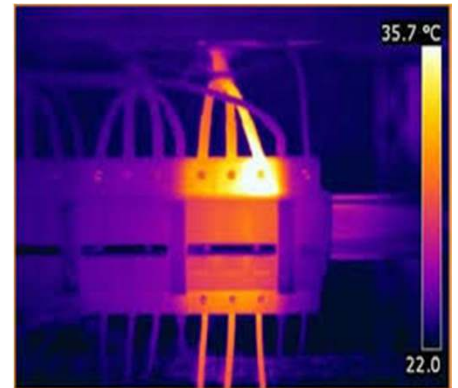
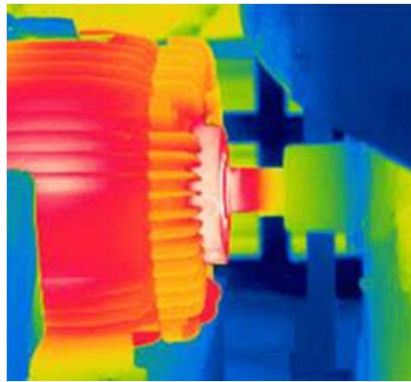
- Mechanical equipment faults
- Overheating bearings
- Lubrication issues
- Process faults
- Damaged refractory lining
- Loose electrical connection
- Over heated cables
- High voltage substation faults
- Blocked pipes
- Steam pipes and traps faults
- Insulation defects

Benefits

- A non-contact and non-invasive inspection technique, often suited as part of a predictive maintenance program.
- An easier, faster and safer method of early fault condition detection
- Inspection, over time, of equipment under same running conditions, allowing thermal anomalies to be easily detected
- Inspection of running equipment under full load, minimizing production interference
- Inspection of difficult to access live electrical equipment
- Reduction of production losses due to unplanned downtime, thus increasing productivity and profitability
- Reduction of time necessary for planned shutdown
- Reduction of maintenance and repair costs
- Increased equipment lifetime and mean time between failures (MTBF)
- Increased availability and reliability of plant



A PICTURE IS WORTH 1,000 WORDS

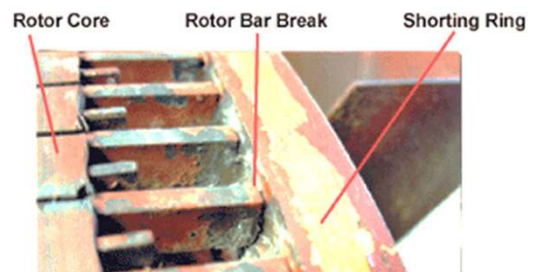
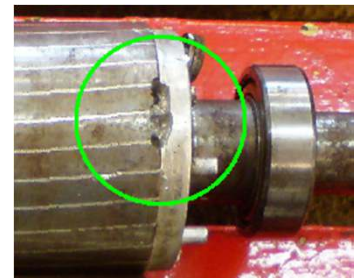
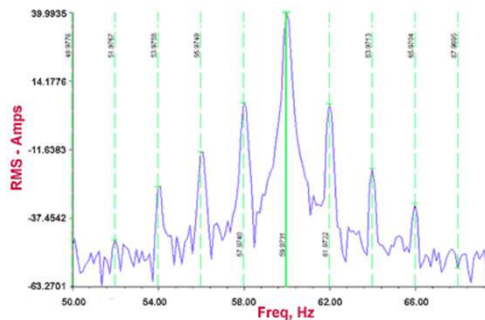




MOTOR CIRCUIT ANALYSIS & POWER ANALYSIS

Main Detectable issues

- Diagnose problems in induction motors
- Static and/or dynamic air-gap irregularities.
- Broken rotor bar or cracked rotor end-rings.
- Stator faults (opening or shorting of one coil or more of a stator phase winding)
- Abnormal connection of the stator windings.
- Bent shaft (akin to dynamic eccentricity) which can result in a rub between the rotor and stator, causing serious damage to stator core and windings.
- Bearing and gearbox failures
- Loose motor foundation
- Belt defects
- Degradation or breakdown of the circuitry
- Current imbalance and loading problems
- Rotor eccentricity
- Power quality disturbances, such as power factor anomalies, voltage imbalance, and harmonics concerns





ULTRASOUND LEAK SURVEY

WHY USE ULTRASOUND FOR LEAK DETECTION

Compressed Air Costs Money!

Industry average 31% of energy use can be avoided by just fixing leaks
Reduce running hours / wear and tear on existing equipment

Specialty Gasses

Cost avoidance, expensive to buy or produce Environmental impact of certain gasses

Production Efficiency

Achieve better efficiency of the process
Run pressures or vacuum pressures at desired levels

Inspection Efficiency & Inspector Safety

Flammable gasses = safety concerns
Refrigeration systems: Use Ultrasound for “bigger leaks” in combination with gas detectors for small leak levels, making your inspection time efficient.



AVOID ENERGY LOSS BY FIXING LEAKS

Industry average: 31% of energy use can be avoided by just fixing leaks



EFFICIENCY & SAFETY

Using soap water creates simultaneously a safety hazard & extra work



COMPRESSED AIR LEAK SURVEYS

Report on cost estimation per leak and demonstrate the carbon footprint reduction.



STEAM TRAP SURVEY

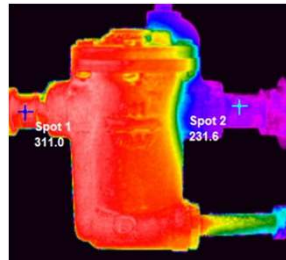
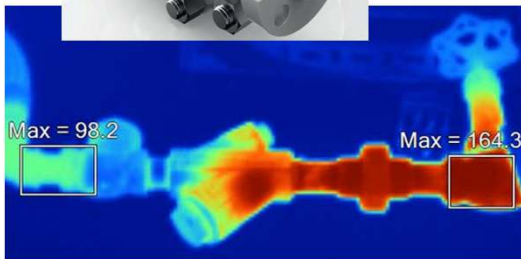
When steam traps leak or fail, it can be extremely costly in terms of product quality, safety and energy loss.

Safety: Water hammer can cause serious damage to your equipment & people!

Manufacturing Process efficiency: Maintaining correct temperatures in your process

Preservation of condensate return lines: Water in pipes will cause rusting

Cost reduction: It is not uncommon to have partial leaking traps costing you in excess of \$10,000/year on just wasting energy consumption



INSPECT ANY TYPE OF STEAM TRAPS

Inverted bucket, thermostatic, thermodynamic, float & thermostatic traps, one-way valves.



SAFETY

Avoid the dangers of failing steam traps. Water hammer can cause serious damage to your equipment & people.



PROCESS EFFICIENCY & COST

REDUCTION


Maintain correct temperatures in your process and preserve condensate return line: water in pipes will cause rusting.



LUBRICATION STUDY

Poor lubrication accounts for over 36% of premature bearing failures.

Our experience with bearings, lubricants and applications helps us to offer the right lubricants for your applications and improve your overall lubrication scheme.

-  **Right Lubricant**
-  **Right Location**
-  **Right Interval**
-  **Right Quantity**
-  **Right Indicators**

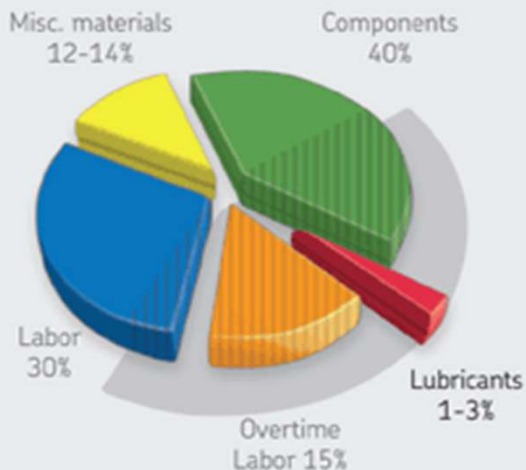


Symptoms

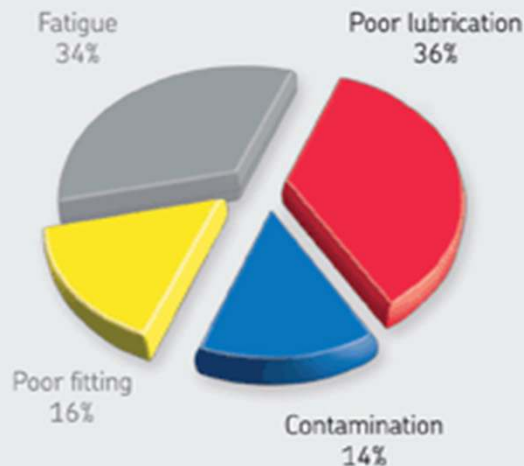
- discolored rolling elements (blue/brown) and rolling element tracks
- excessive wear of rolling elements, rings, and cages



Total maintenance budget



Premature bearing failure





VIBRATION ACCEPTANCE TESTING

Vibration Acceptance Testing

Acceptance testing is a powerful tool to ensure new or rebuilt critical equipment meets customer's and ISO, ASNT, BINDT standards. Too many times, newly commissioned equipment performs poorly and the customer finds themselves between various vendors all pointing the finger in the other direction.

- Identifying equipment information and operating condition details
- Bearing temperatures
- Elevated resonant frequency responses at various operating conditions
- Vibration amplitudes results by data point and compared to required limits



VIBRATION SEVERITY PER ISO 10816					
Machine		Class I small machines	Class II medium machines	Class III large rigid foundation	Class IV large soft foundation
in/s	mm/s				
Vibration Velocity Vrms	0.01	0.28			
	0.02	0.45			
	0.03	0.71		good	
	0.04	1.12			
	0.07	1.80			
	0.11	2.80		satisfactory	
	0.18	4.50			
	0.28	7.10		unsatisfactory	
	0.44	11.2			
	0.70	18.0			
	0.71	28.0		unacceptable	
1.10	45.0				

●●● FORENSIC FAILURE ANALYSIS

Accidents happen all the time — equipment fails and people get hurt every day. We perform failure analysis testing for forensic investigations.

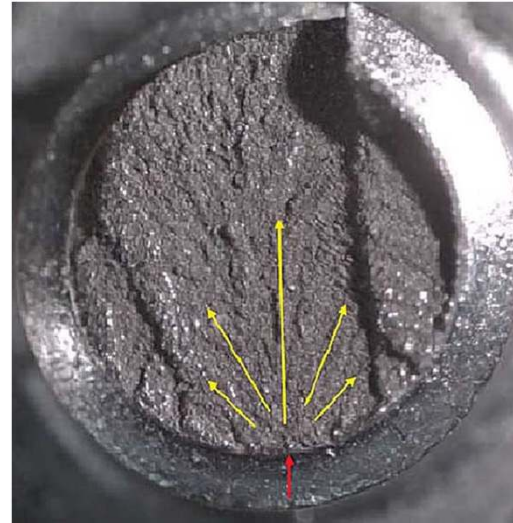
By applying our understanding of engineering principles and safe design concepts to forensic investigations, our personnel can deliver sound scientific conclusions to support the client's litigation process.



(a)



(b)



(c)



(d)

