



Capabilities of the Team 2009

**Our Mission is to help you
*find and eliminate sources
of trouble in equipment
and processes.***

1-800-732-2890

www.theADVANCEDteam.com

**Asheville * Charlotte * Cincinnati * Lynchburg
Greenville/Spartanburg**

Machinery Alignment

- * Roll Parallel**
- * Extruder Barrels**
- * Thermal Growth**
- * Turbines and Pumps**
- * Shaft Alignment**

PdM Technologies

- * Vibration Analysis**
 - * Thermography**
 - * Leak Detection**
 - * Oil Analysis**
- * Precision Balancing**

Training Classes

The ADVANCED Team, Inc.

The ADVANCED Team, Inc. is a group of specialists who come from varied backgrounds and experiences. Our service professionals provide diagnostic, corrective, and analytical services to both large and small corporations. ADVANCED Team members combine decades of experience, and are certified in Vibration Analysis, Machinery Geometric Alignment, and Thermography. We are members of TAPPI, The International Maintenance Institute, and The Vibration Institute. The Team is published in various trade publications, and is called on to give presentations to diverse groups. Driven by the challenge and the science of troubleshooting, the service team is constantly striving to achieve and exceed their customers' needs. In addition to consulting, this specialized group works to develop unique fixturing and methodologies of metrology that are specific to certain industries, allowing each manufacturing process to produce with greater accuracy, better quality, less waste and more reliability than was previously thought possible.

The various career paths our Team members have followed provided rich experiences and problem-solving experts who are not afraid to think "outside of the box". Their wealth of knowledge allows our service team to draw from many different industries for answers. Their careers have taken them to off-shore oil platforms in the Gulf of Mexico, gold mines in Alaska, converting facilities across the US, and gratis work for Clemson University's Food Packaging Science Department. Because of their numerous and varied experiences, our service experts have come to appreciate that machinery and processes can react differently under diverse external forces. Production is dependent upon the efficiency of the equipment along the process. Many things can go wrong with a process, and the initial troubleshooting assessment may decrease waste, possibly increase line speed; most importantly help produce a quality product, and all of this often without replacing machinery.

Industries Served

ADVANCED customers include the following:

Woven Fabrics

AstenJohnson
Ahlstrom

Nonwovens

Freudenberg Spunweb
BBA America

Steel

AK Steel
North American Stainless
Severcorr

Electricity

Detroit Edison
Mid-American Energy

Wire & Cable

National Standard
Republic Wire

Food, Beverage Products & Packaging

Miller Brewing
Masterfoods (M&M Mars)
Pliant
Clorox (Glad Manufacturing)

Automotive Products

Performance Friction Corp.
Reeves Brothers

Chemicals

ISP Chemical Products
Dow Corning

Gears and Gearboxes

GETRAG gears
L3 Communications

Lumber & Construction Materials

Pease Industries (Pella)
Guardian Industries (glass)
Owens Corning
Lafarge Gypsum

Dynamometers

Dyno 1
Cummins Research & Development

Plastics, Petroleum & Rubber

Automated Packaging Systems
Shell Oil
Goodyear Tire and Rubber

Engineering/R & D

Pro Engineering & Manufacturing
Rolls Royce
Danaher Motion

Tape, Adhesives & Polymers

Intertape Polymer Group
Arjobex America

Paper

International Paper
Weyerhaeuser

Vibration Analysis

Vibration Analysis is a nondestructive testing technique used to monitor and trend particular rotating equipment with the aid of a FFT spectral analyzer. In addition to condition monitoring, this technology allows us to determine such conditions as:

- Overall bearing condition
- Imbalance conditions
- Structural support deficiencies
- Rotational and Alignment concerns

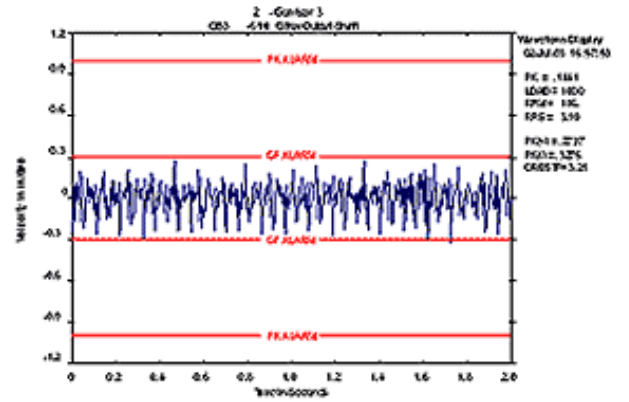
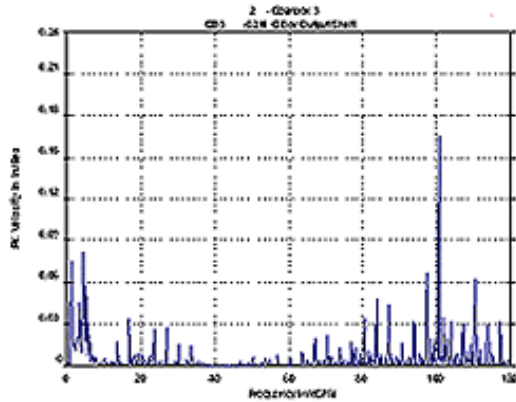
Customized machinery condition analysis identifies unbalance, misalignment, bearing defects, electrical problems, resonance, looseness, etc.

We can arrive at your site to perform a detailed vibration analysis on one machine or on your entire plant! State of the art measurement equipment and over 100 years of combined experience provide the best service available today. Most importantly, the professional who collects the data will be the same professional that performs the analysis and issues a report on the findings and the recommendations for improvement.

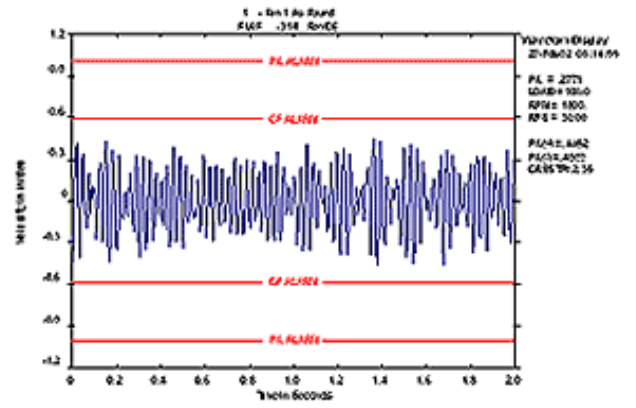
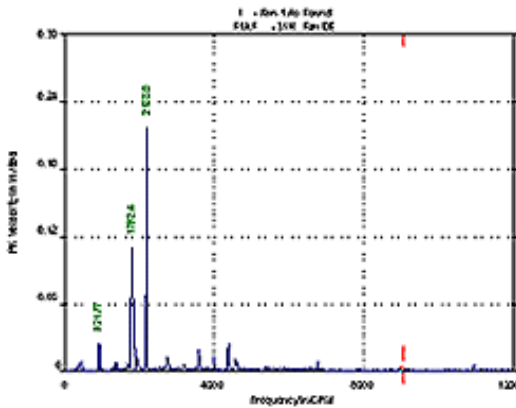
Just as important, if a severe defect is identified on-site, you will be notified of the problem prior to ADVANCED personnel leaving the site. If the problem is imbalance or misalignment, your service professional is capable of correcting the problem.

This is just another way we provide the superior service capabilities you need to help keep your plant up and running at peak efficiency.

Examples of Vibration Data that are analyzed.



The Above Spectrum and Time Waveform Show Gear mesh Vibration on a Gearbox

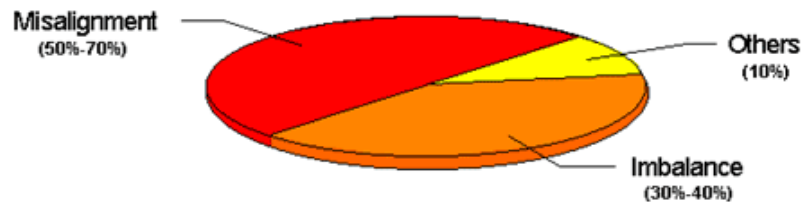


The Above Spectrum and Time Waveform Show an Unbalance Fan Rotor (2188 rpm). Additional Peaks labeled in the Spectrum are 2x Belt Speed (921.77 rpm) and 1x Motor Speed (1792.4 rpm)

In-Place Dynamic Balancing

In-place computerized dynamic balancing of rotating equipment reduces bearing load and increases machine life.

Major Sources of Machinery Vibration



It is proven that precision in-place dynamic balancing leads to increased machine life, lower vibration, increased seal life and greater Mean Time Between Failures. Unbalance currently accounts for nearly half of all machine failures. ADVANCED Team service personnel will arrive at your location with state of the art technology and experienced, highly trained personnel. Following the balancing operation, a complete vibration analysis of the machine will identify any other problems that exist with your machine's components such as:

- Bearing Defects
- Looseness
- Gear Wear
- Misalignment
- Bent Shafts
- Foundation Degradation

A comprehensive report detailing what was found, what was done and the machine's reliability condition will be issued. Additional recommendations may also be included to further help you improve the machine's condition. The bottom line, if your machines are properly aligned and balanced, you have just decreased the likelihood of a failure, sometimes by as much as 90%.

That means **YOUR** bottom line improves!

Laser Shaft Alignment

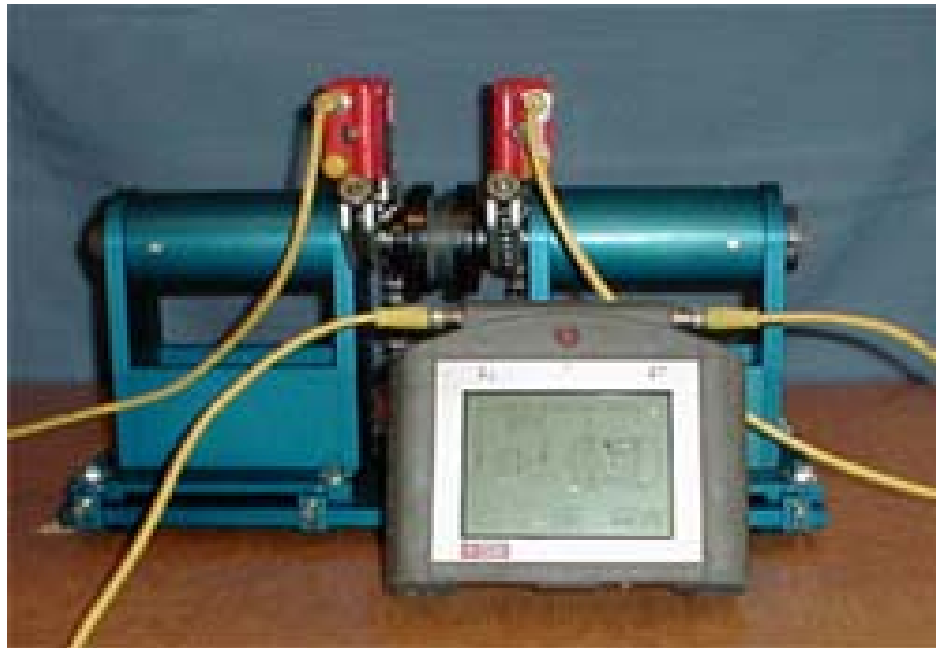
The ADVANCED Team aligns machinery, and a variety of machinery. We utilize lasers and optical tools to precisely align pumps, fans, generators, turbines, motors, gearboxes, machine trains, sheaves/pulleys, extruders, platens, presses, machine tools, etc.

No matter what the equipment is or how the driver is coupled to the driven unit, precision alignment will have a positive impact on the operational life of the bearings, couplings, seals, shafts, etc and may even reduce the power consumption of the system.

This is true whether the system has a coupling, universal joint or belts...It needs to be precisely aligned.

Utilizing the accuracy of state of the art laser measurement systems, shaft alignments can be quickly measured, aligned and documented.

Your process will benefit from reduced downtime, reduced repair costs and most importantly, more of your product will be going out the door.



OL2R Dynamic Alignment Measurements

Measurement of the true positional changes in machinery alignment from "off-line-to-running" is the new standard for machinery that has a differential in operating temperatures for the different components.

OL2R or "off-line-to-running" measurements quickly and accurately measure the total change in machinery alignment that results from thermal changes, dynamic machine loading, pipe strain, rotor torque, speed, etc. The result is an accurate set of Cold Alignment Targets that will allow the machine or machine train to operate at optimum alignment under normal operating conditions. These measurements can typically be carried out in less than one day. Additional time may be required to properly align the machines following the data collection. OL2R or "off-line-to-running" is a non-intrusive, safe and economical way to get the proper cold alignment targets for your machinery.

Example of OL2R

OEM Target: Engine Low by 25 mils (Vertical Offset) Coupling open at the bottom by 0.8 mils/1"

Two Identical Machines were measured. Actual changes were as follows:

Unit 1: Vertical Offset: -35 mils

Vertical Angle: +0.4 mils/1"

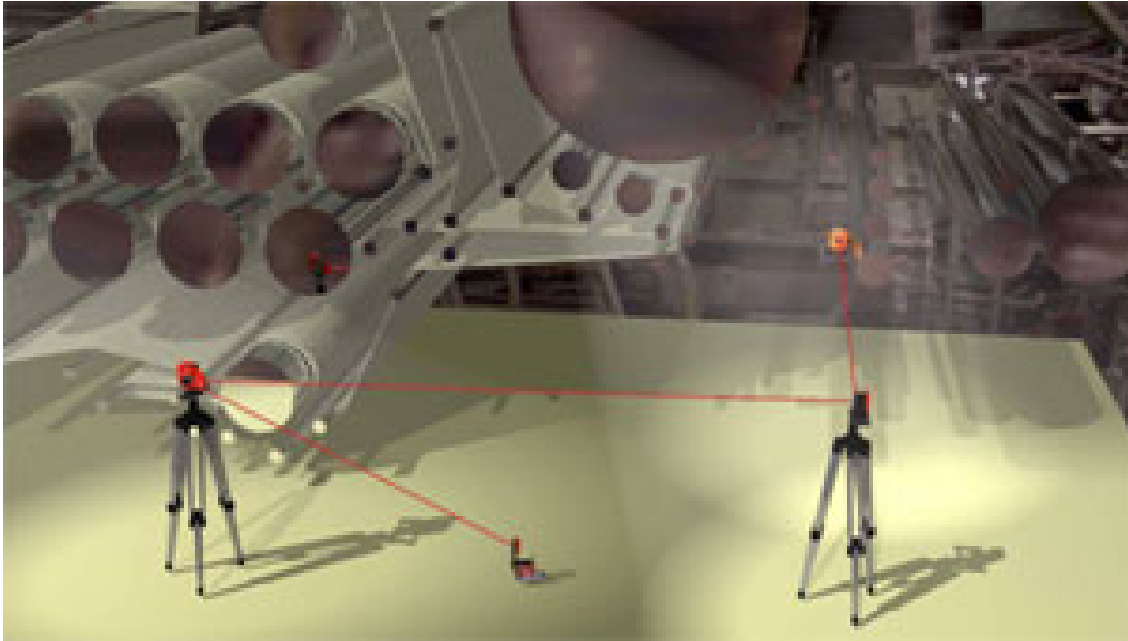
Unit 2: Vertical Offset: -45 mils

Vertical Angle: +0.3 mils/1"

Note: "Identical Machines" do not exhibit "Identical" thermal growth characteristics

Roll Parallel Machine Geometry

Precise measurements of web process and machine geometry for flatness, straightness, squareness, level, parallelism, bearing centers are critical for the efficiency of any process line.



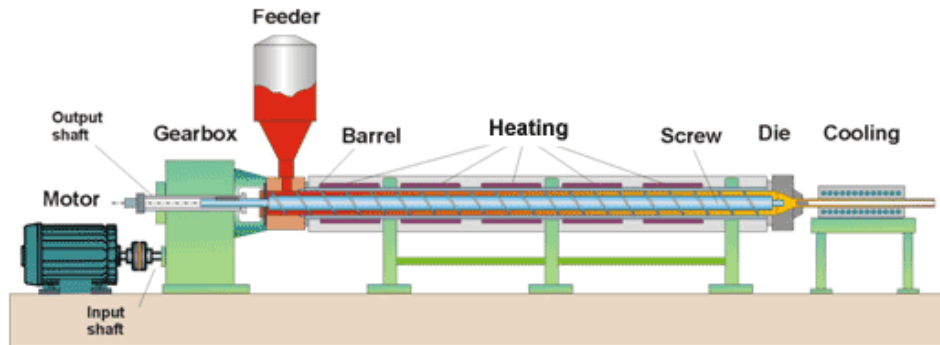
Paper, Steel, Fabric, Aluminum, Tissue, Film, Non-wovens, Plastics, Glass, Laminates, Printing... ANY WEB PROCESS...benefits from precision alignment of the rolls. Precision roll parallel measurements and alignment help prevent product wrinkles, tracking problems, tear-outs and operator headaches! Often, the production speed can be increased following precision laser roll alignment. The speed, accuracy and reproducibility of the laser system are unequalled with optics, piano wires, etc.

Measurements are taken in a fraction of the time required by other methods and are documented as they are taken. Live adjustments allow quick positioning of the rolls.

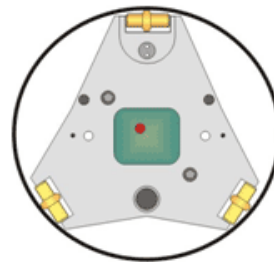
If your offset line is incorrect, the software allows instantaneous reference changes. Now that immovable roll can be the new reference, without re-measuring or adjusting the laser system.

Extruder Barrel Laser Alignment

Proper alignment can extend the life of extruder barrels and screws by precisely positioning the feed throat and output end of the extruder to coincide with the gearbox output center of rotation.



Laser Detector



The ADVANCED Team's unique extruder measurement system allows quick and precise measurements of the barrel relative to the gearbox center of rotation. Extruders are critical to the plastics industry. Proper alignment of the feed throat and the barrel are critical to long life of the barrels and screws. A laser transmitter is installed on the output shaft of the gearbox and adjusted to represent its center of rotation.

Positional adjustments are made "live". Typically, the barrel can be aligned to within 0.001" of the OEM or customer specification, horizontally and vertically, with respect to the gearbox output shaft!

Predictive Maintenance

The objective of predictive maintenance is to regularly monitor, measure, and track selected parameters or operating performances of equipment in order to predict problems prior to failure. A predictive maintenance program is an extension of a good preventive maintenance program.

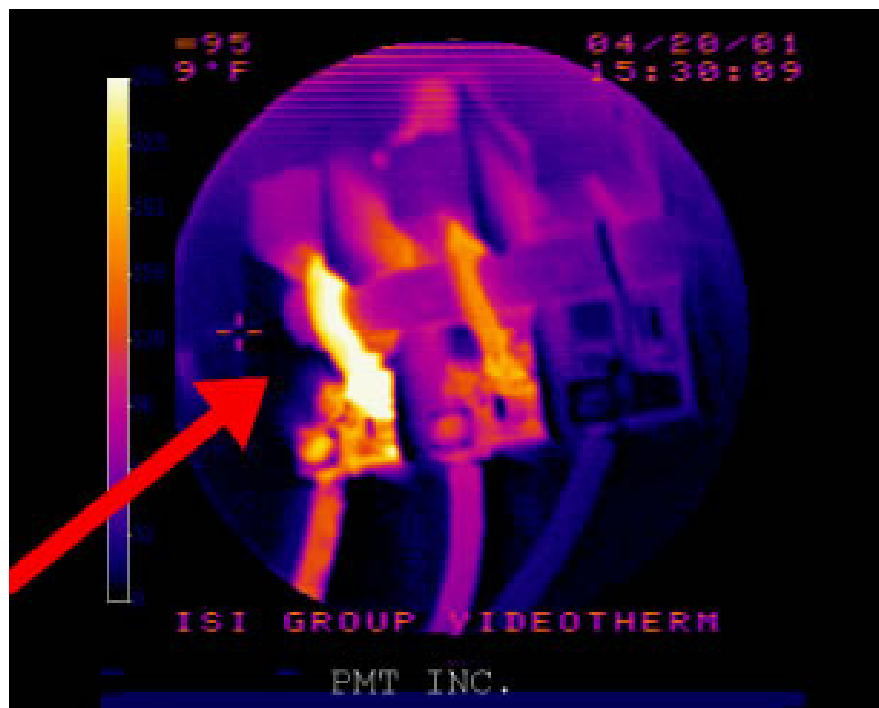
An effective predictive maintenance program will allow for the proper scheduling and planning of equipment repairs. Other benefits would include: Fewer unexpected machine downtimes, optimizing scheduling of resources and manpower, increasing productivity, improving product quality and reducing maintenance cost. Our testing includes:

- **Ultrasonic inspections** Ultrasonic testing is a very cost-effective predictive technology. It is utilized to pinpoint sources of ultrasonic energy with a hand-held ultrasonic “gun.” Typical uses are:
 - Bearing inspection routes on support machinery;
 - Lubrication routes - poor lubrication can be heard when listening through the ultrasonic gun;
 - Compressed air and gas leak surveys;
 - Electrical arcing & Corona discharge.

- **Temperature monitoring** - Monitoring changes in motor and bearing temperatures provides an early indicator of machine failure.

- **Stroboscopic analysis** - This technique utilizes a portable strobe to inspect rotating equipment for wear such as on couplings and V-belts.

- **Infrared Thermography** Infrared technology consists of using a portable, infrared camera to capture thermal images. These images allow for analysis of temperature deviations on critical processes and motor control centers. Infrared scanning allows identification of thermal discrepancies and aids in the determination of the following detrimental conditions:
 - Loose electrical connections;
 - Corrosion and dirt build up that induces high resistance joints;
 - Unbalanced electrical loads;
 - Mechanical and Process problems due to heat;
 - Leaks and inconsistencies about the roof of a facility;
 - Improper Mechanical installation/repair;



- **Oil analysis** - “Tribology” is one of the oldest forms of non-destructive testing of machinery. Oil samples are taken from equipment and tests are conducted with resulting values compared to those of clean, reference oils. Industrial oil analysis should include more than vendor-supplied spectral and chemical analysis. Wear and particle debris analysis is a more reliable and trend-able parameter. Oil analysis is performed on various types of equipment such as: gearboxes, hydraulics, and bearings. Testing the current condition of lubricants will determine the following:
 - Suitability for continued use (additive depletion & viscosity);
 - Presence of machine wear debris (metal particulate);
 - Presence & identification of contaminants (water, dirt, process material);
 - Confirmation that the correct oil is being used in each machine;
 - Need for further maintenance testing.

Benefits of an Oil Analysis Program:

- Predict potential machine failures before they occur
- Extend oil change intervals (change oils based on condition rather than time & as a result, save money)
- Detect abnormal machine or lubricant conditions with routine oil analysis & trending of results
- Extend oil life with contamination control practices and filtering as needed

- **PdM Needs Analysis & Development** The ADVANCED Team can help your facility with lean manufacturing, six sigma, RCM, TQM, and other quality assurance and production driven programs.

Machinery Alignment, Vibration & Balancing Training

The ADVANCED Team is passionate about transferring our knowledge base to others. Whether at your plant or at one of our facilities, that passion is prevalent in our training classes. We provide manufacturer specific or generic, precision alignment, balancing, and vibration analysis training.

With over a century of combined experience, The ADVANCED Team, Inc. is uniquely qualified to train your personnel. ADVANCED Training classes are conducted by service personnel, not by someone trying to sell you more equipment. We know how the alignment equipment truly works...not just how to give an expanded demonstration. Our experience covers virtually all of the alignment products available today. Dial Indicators, Single Laser Measurement Systems, Reflected Beam Measurement Systems and Dual Laser Measurement Systems. We also offer non-product specific alignment training.

Quite simply...we teach alignment!

We believe that proper use of an alignment tool requires a lot more than a short course in "button-ology". Our courses are filled with hands-on training and offer solutions to real world problems. Of course, the word "Alignment" covers a lot of ground. The ADVANCED Team is proud to offer beginner and advanced courses in:

- Geometric Measurement
- Extruder Barrel Alignment
- Roll Parallel
- Straightness
- Bearing Centering
- Shaft Alignment
- Basic Machinery Alignment and Correction



We hope that this has given you an overview of The ADVANCED Team, the services that we provide, and our specialized service personnel and trainers. We would welcome an opportunity help your facility solve problems, have more reliable equipment, a better trained staff and increased profit!

Remember our Mission is ***to help you find and eliminate sources of trouble in equipment and processes.***

Thank you for your time and interest, The ADVANCED Team, Inc.

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