



SonicDiagnostic

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Sonic Diagnostic
NDT Instruments and Measurement Systems



Let's create a safer world.

Overview

SonicDiagnostic is an innovative company in the fields of non-destructive and measurement systems, which supplies products and solutions based on acoustic and vibration, eddy current, and image processing of parts and materials in production.

SonicDiagnostic incorporates state of the art technology and equipment to provide highly specialized testing procedures.

We offer a complete solution including feasibility study and parts analysis, installation of customized test line, instrumentation, software, calibration, customer support and training.

Sonic Diagnostic team is committed to delivering timely, high-quality solutions to customer needs, and is driven by professionalism, integrity, and reliability.

Acoustic Resonant

Eddy Current

Balancing Machine

Gage Vision



ANYTHING
HAS IT'S
OWN
SOUND

EddySonic-ARI
Acoustic Resonant Inspection System

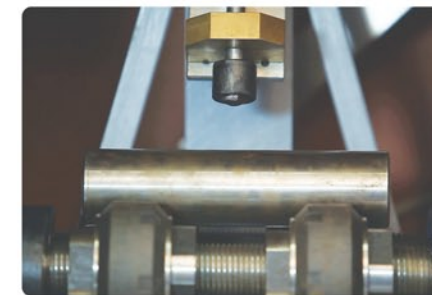
Acoustic Resonant Inspection

Description

EddySonic-ARI offers rapid and inexpensive method of 100% inspection of parts. EddySonic-ARI can be used to test components for mechanical properties, nodularity in ductile cast irons, hardness, density, and to detect structural defects such as cracks, cold shots and inclusions.

EddySonic-ARI principle of operation is based on analyzing resonant frequencies of parts. The presence of structural defects causes shifts in these frequencies, changes in damping factors, or nonlinear effects such as generation of new frequencies.

Each part has a unique resonant signature and any deviation from the expected signature indicates the presence of a flaw. To excite the structure and cause it to vibrate an inertial or piezo impact hammer is used. The part vibrations are recorded by microphones or accelerometers. Advanced signal processing methods are used to detect natural frequency peaks and their damping factors with a resolution down to 0.2 Hz.



EddySonic-ARI generates a “decision module” based on advanced data modeling methods to sort the parts. “Good” parts have consistent spectral signatures, while the resonances of “Fail” parts are different. The decision module checks multiple criteria, each one follows a particular “logic” to separate defective parts. These criteria analyze the acceptance range of resonant frequencies, the relationship between multiple frequencies, and the classification result between Pass/Fail groups. A clustering algorithm is applied to compensate for acceptable process variations.

A large variety of data viewing tools are available to compare the test results of a new part with the statistical features of the reference parts in the database.

We provide customized mechanical units for fixturing, automation, and acoustic isolation.

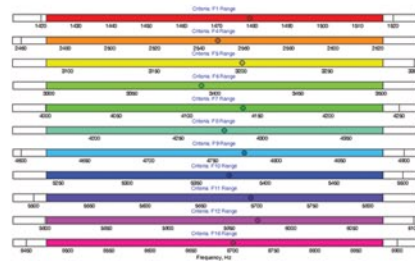
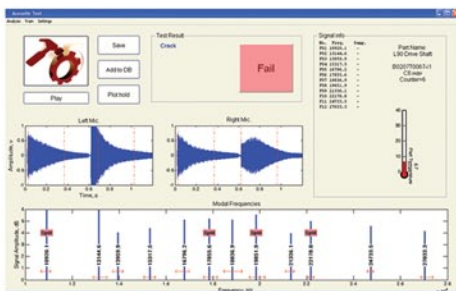
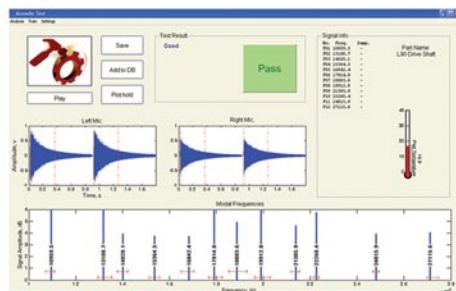


Applications

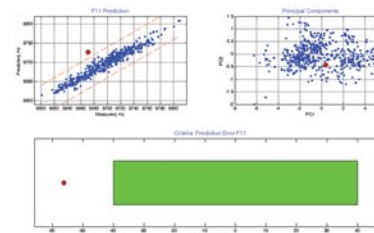
- Testing Mechanical properties such as Young's modulus and break strength
- Nodularity test in ductile cast irons
- Hardness testing
- Detection of residual stress and hardness non-uniformity
- Detection of cracks and detached layers

Features

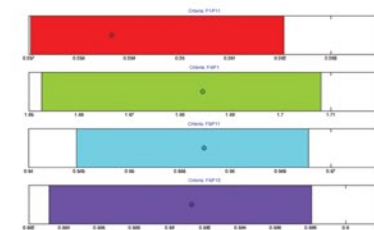
- High speed, accurate and repeatable measurements
- Advanced data modeling and statistical methods for grouping of parts
- Possibility to calibrate with only OK parts
- Integratable with Eddy Current system (EddySonic-EC)
- Temperature compensation of results using infrared thermometer
- Dust-proof and weather resistant enclosure
- I/O control signals for automation
- Easy to use and user friendly Windows-based interface
- Report generation, including statistical analysis



Natural frequencies of a good part and the accept ranges (Test mode).



Frequency prediction results of a defective part (Test mode).



Ratio of frequencies of a good part and the accept ranges (Test mode).



EddySonic-EC

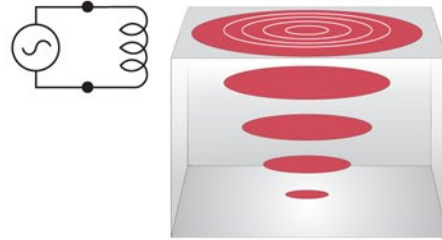
Multi-Channel, Multi-Frequency, Real-Time Eddy Current Tester

Description

EddySonic-EC is a high-performance, easy to use, and economical Eddy Current tester that offers 100% inspection of parts. EddySonic-EC can be used to test components for properties such as hardness, case depth, temper, alloy, material mix, presence of internal stresses, machinability and dimensions.

EddySonic-EC principle of operation is based on multi-frequency analysis of harmonics and phases. During calibration or learning, a database of reference parts including good and different defective parts is made. Typically, the database can be set up with 100 to 500 good parts from different production batches. Various defective parts can be optionally included in the database.

EddySonic-EC it has the capability of real-time and simultaneous monitoring of multi-channels at multi-frequencies. Multi-channel testing allows local inspection of large parts as well as differential inspection of pipes and cylinders to detect non-uniformities.



Simultaneous multi-frequency testing applies a synthesized wide band signal (superposition of multiple frequencies) to the coil. Hence, the test is much faster than traditional sequential testing of single-tone frequencies. Real-time testing allows scanning or continuous inspection of parts such as tubes and bars, while the eddy current probe or coil is moved into or over the part.

A large variety of data viewing tools are available to compare the test results of a new part with the statistical features of the reference parts in the database.

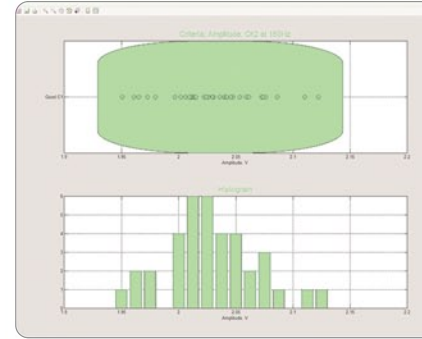
Applications

- Hardness testing of ferrous materials and alloys
- Heat treatment verification such as surface hardness and case depth
- Evaluation of material integrity, strength, and chemical composition
- Machinability assessment
- Dimensions and thickness measurement
- Real time scanning of tubes and bars

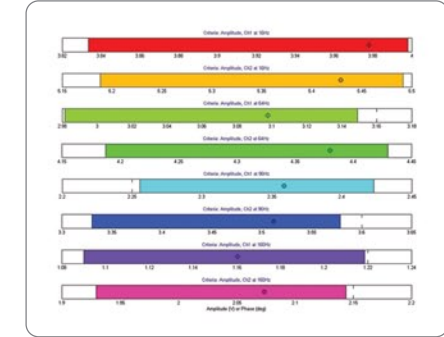


Features

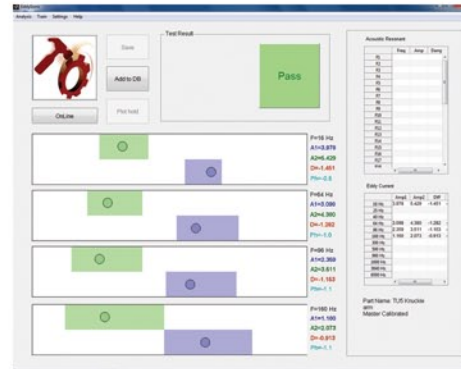
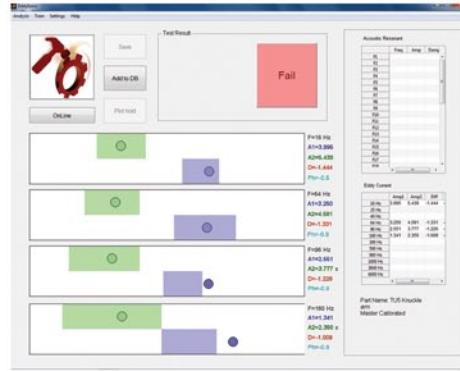
- Simultaneous multi-frequency testing at 2 channels
- High speed and real time test report and visualization every 50 ms
- Advanced data modeling and statistical methods for grouping of parts
- Integratable with Acoustic Resonant Inspection system (EddySonic-ARI)
- Possibility to calibrate with only OK parts
- Temperature compensation of results using infrared thermometer
- Dust-proof and weather resistant enclosure
- I/O control signals for automation
- Easy to use and user friendly Windows-based interface
- Report generation, including statistical analysis



Distribution of database samples at one of the frequencies.




Voltage responses of a good part and the acceptance ranges



Accessories

Encircling coils and probes are available in a variety of sizes or custom built for special applications. Fixturing and automation, required to hold or move the part/coil during the inspection process, can be provided as well. Specifications

- Test Frequencies:
10 test frequencies ranging from 16Hz to 6kHz
- Amplifier gain:
Automatic and manual adjustable gain in 100 steps
- Coil channels:
2, option up to 4 channels
- Power input:
120/240VA



Balancing Machine-BC2

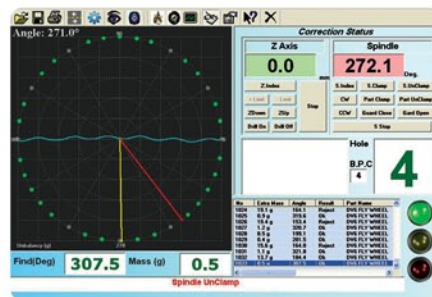
Vertical Balancing and Correction Machine

Vertical Balancing and Correction Machine

Our universal vertical balancing machines are single-plane hard bearing types, generally used for balancing disk shaped rotors. This includes flywheels, pulleys, brake disks, clutches, etc. The balancing machines are equipped with automatic correction machines with a short cycle time.

The correction unit automatically decomposes the unbalance vector into a series of holes at allowed angular positions. A look-up table can be defined to constrain the location, depth, and offset of holes. The unit is equipped with a linear encoder for accurate controlling of hole depths, and a rotary encoder for accurate controlling of hole positions.

A large variety of custom-designed adaptors and clampers with precise centering and zero-backlash are provided.

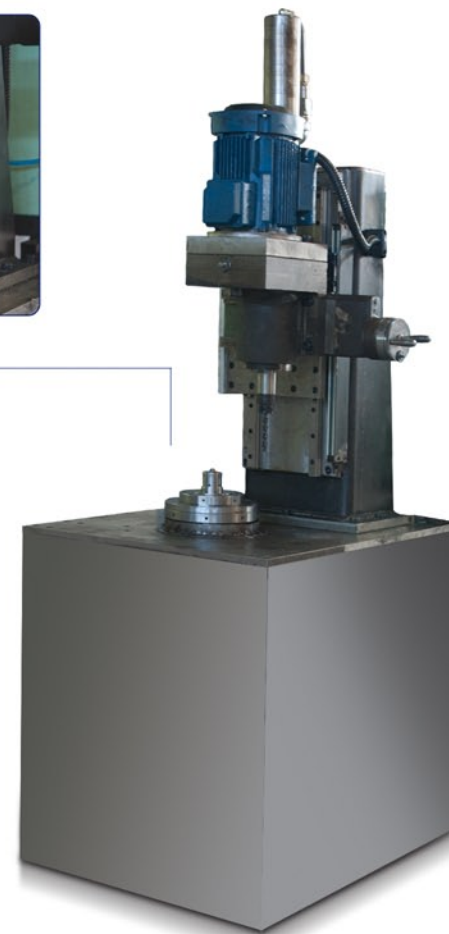


Applications

- Flywheels
- Brake Discs
- Pulleys
- Gears
- Clutches

Specifications

- Max rotor weight with adaptor: 15 kg
- Angular position accuracy: 1°
- Max diameter: 40 cm
- Balancing speed: 600-1200 rpm
- Measuring accuracy: 1 g.cm





Measuring...

Gage Vision-GV1

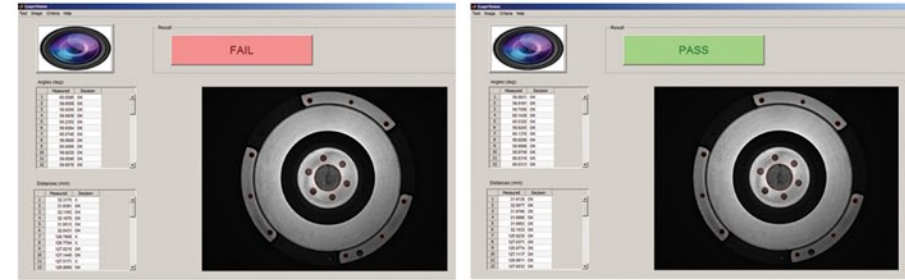
Machine Vision System for Precision Gauging

Description

GageVision is an on-line gauging and measurement system using image processing of parts. It is a fast, easy, and accurate way to check dimensions, position of drill holes, angles, and distances. The software uses high precision (sub-pixel) tech

niques to compute the edges and centers of circles (drill holes). The user can define search region for drill holes and subsequently define different criteria such as distance between two points and angle of three points.

The system uses high-resolution industrial camera, precision lens and uniform LED lighting. The optical unit is protected against dust with an air pressure curtain.



Features

- Fast, easy, and accurate inspection of parts
- On-line and off-line (file) processing modes
- Tools for camera control and image enhancement
- Automatic lens and geometric calibration
- High precision (sub-pixel) measure of circle centers and edges
- User defined criteria (50 distances + 50 angles)
- Industrial camera, lens, and lighting
- Industrial computer and rack

