ALAT UJI

Products, Solution, Services

Echomac® VM

Velocity Measurement to Assess Nodularity in Ductile Iron Cast Automotive Components

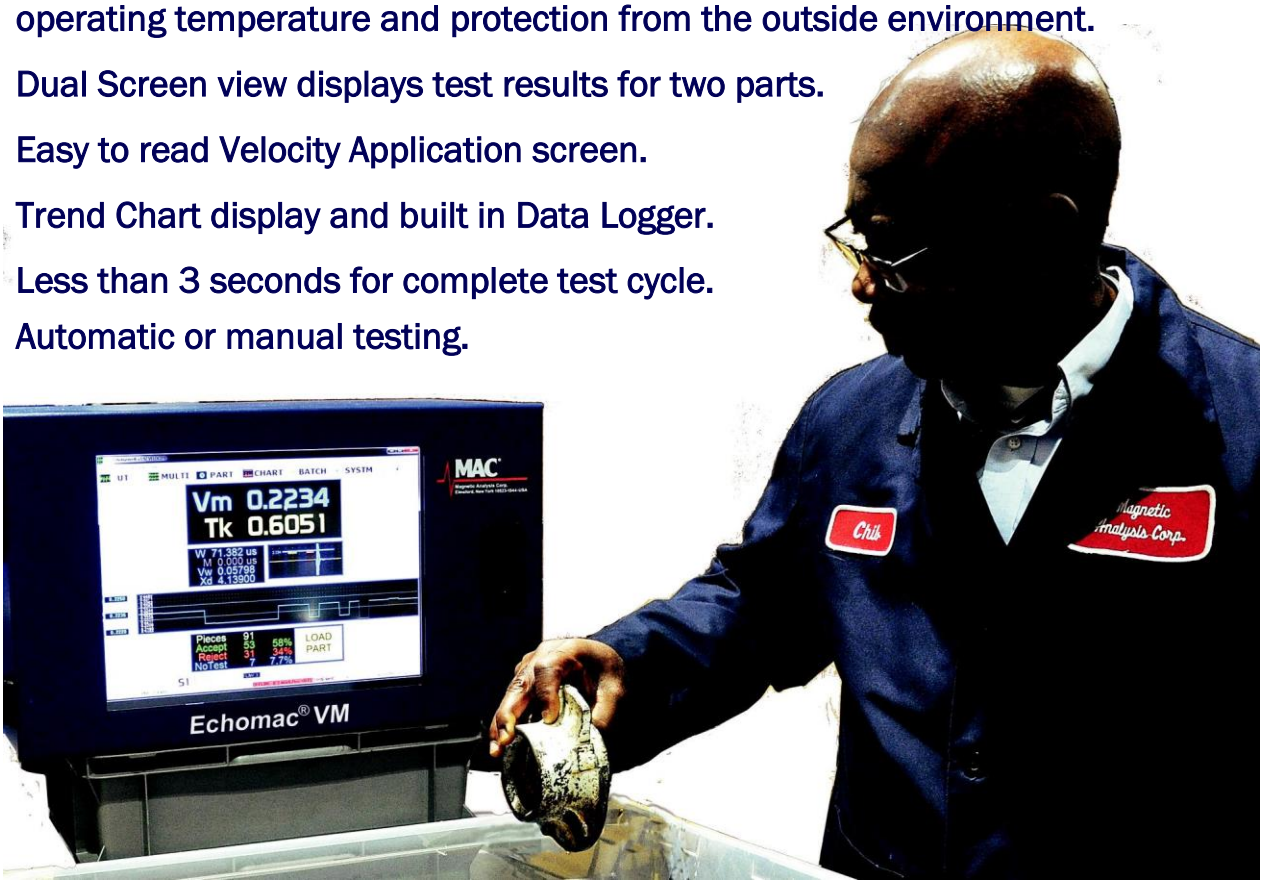
As the use of nodular graphite iron material has expanded in recent years for automotive safety parts, ultrasonic velocity measurement provides an industry accepted, reliable means of verifying the material integrity of the part. Unacceptable degrees or variations in Nodularity, a type of graphite structure that can develop during the production process, can attenuate the velocity of sound waves passing through the material. The Echomac® VM measures the sound velocity and, using known limits, reports whether the part is acceptable.

Simple, Effective Instrument to Test Velocity

Echomac® VM Features

- ❒ Operates with either full immersion or bubbler couplant technology.
- ❒ Test two parts simultaneously in separate test stations using one instrument.

- ❒ Evaluate Velocity, Thickness or Flaw detection.
- ❒ Standard configuration has 2 Velocity channels and 2 Flaw channels with an option for 4 additional Flaw channels.
- ❒ Industrial hardened I/O connections are protected from the environment.
- ❒ Enclosure includes a closed loop heat exchanger to ensure proper operating temperature and protection from the outside environment.
- ❒ Dual Screen view displays test results for two parts.
- ❒ Easy to read Velocity Application screen.
- ❒ Trend Chart display and built in Data Logger.
- ❒ Less than 3 seconds for complete test cycle.
- ❒ Automatic or manual testing.



Live A-scan during test

The new Echomac® VM Velocity Measurer is designed and manufactured by Magnetic Analysis Corp., a US based leader in supplying NDT instruments, systems and service for more than 85 ye rsa.

www.mac-ndt.com

Echomac® VM Instrument Technical Data

PULSER	
SPIKE VOLTAGE	500 Volts into 50 Ω, adjustable 0 to 100% in 1% steps
RISE TIME	10 ns or less
DAMPING	50 Ω OR 200 Ω
REPETITION RATE	0.8 TO 15 kHz per channel, adjustable in 0.1 kHz steps
PULSE DELAY	1 to 1000 µs steps, adjustable in 1 µs steps
PROBE TYPE	Through Transmission

RECEIVER/AMPLIFIER	
BAND WIDTH	0.4 to 30.0 MHz
GAIN	0 to 60 dB, adjustable in 0.25 dB steps
DIFFERENTIAL GAIN	Adjustable in the full gain range for each gate interval
HIGH PASS FILTER	0.4 MHz cutoff frequency
LINEAR REJECT	Digital (adjustable from 0 to 40% in 1% steps)

EVALUATION	
DIGITIZER	100 MHz base sampling rate 400 MHz TOF resolution
RECTIFICATION MODES	RF Gating
VELOCITY RESOLUTION	0.0003 inches/µs 0.007 km/s
VELOCITY RANGE	500 to 20,000 m/s
THICKNESS RESOLUTION	0.0025 µs 0.0003 inches in steel 0.0076 mm
MEASUREMENT TECHNIQUES	Flank
MEASURING RANGE	2.5 to 500mm (in steel)

A-SCAN DISPLAY	
MODES	FW, PHW, NHW and RF display
GATES	Bar display
DAC CURVE	16 segment, no width limitations, any segment can be increasing or decreasing, mouse drag adjustment
RANGE	1 µs or greater
DEPTH	500 points
DELAY	-10 to +499 µs
TRIGGER MODES	Initial pulse (IP) or interface echo (IF) with delay
TRACES	1,2,4, or all (overlaid on baseline)

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GATES	
NUMBER	1 interface and 4 measurement
LIMITS	Min velocity and max velocity Or Min thickness and max thickness
SYNCHRONIZATION MODES	Initial pulse (IP) or interface echo (IF)
MEASUREMENTS	Component velocity Min, max, and average velocity Component thickness Limits evaluation (alarms)
RANGE	0.1 to 500 µsec
DELAY	0.04 to 499 µsec

OUTPUTS	
OPTO ISOLATED LOGIC & SOLID STATE RELAYS	Reject on Min/Max Velocity or Flaw Accept Load Part No Test
ANALOG PART THICKNESS	5 volts full scale (12 bit)
VELOCITY TEST CYCLE TIME	less than 3 seconds for complete test cycle

NETWORK	
NETWORK	10/100 Ethernet. TCP/IP, Remote application can control test parameters and view signal waveforms.

COMPUTER	
COMPUTER	Intel dual core process. Ethernet, 120 GB FD, keyboard, mouse, USB ports, Windows 7 Professional

OPERATING CONDITIONS	
AC POWER REQUIREMENT	Under 500 VA from a 115 V or 230 V, 50 or 60 Hz line
ENCLOSURE	Standalone computer enclosure with integrated monitor. These units come with electric coolers
WEIGHT	46 lbs. (20.87 kg)
DIMENSIONS	24”L x 12”H x 12”D (61cm x 30.5cm x 30.5cm)
OPERATING TEMPERATURE RANGE	0 to 50 degrees C (32 to 122 degrees F)