

STEEL QUALITY CONTROL

Flaw Detection in Steel Plate and Pipe

Digital oscilloscope recorders are useful for flaw detection in quality control of steel plates and pipes.

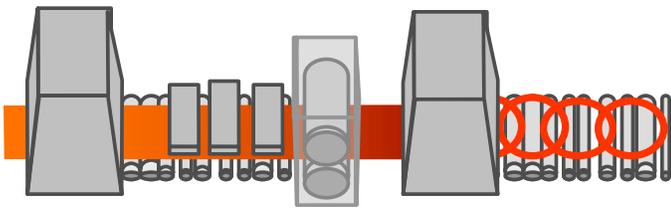
High precision and reliability are required for long-life products used in plants such as steel pipes and seamless pipes. Flaw detection data is used to detect internal defects (bubbles, nonmetallic inclusions) in thin steel sheets and during wire quality control.

Quality requirements are becoming more strict each year for surface scratches and fissures in deformed bars used for rebar for high rise buildings. It is difficult to detect scratches on the surface with irregularly shaped bars in products, but flaw detectors with eddy current technology have been developed and are actively used in quality control.

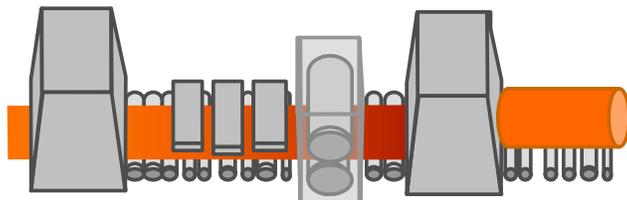
The RA Series is useful for data recording for rolling quality confirmation.

Automatic Recording Image of Bar, Wire, Steel Pipe (Hot Rolling/Cold Rolling) Process

Wire and Rod Material Production Facility



Steel Pipe Manufacturing Facility

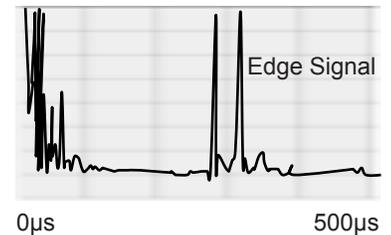


Process Computer (Control System)



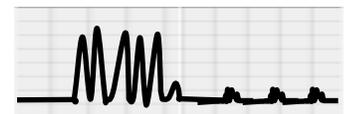
Recording Image of Plate Wave Flaw Detection

A plate wave flaw detection device with a tire probe has been used conventionally to detect on-line internal defects (bubbles, nonmetallic inclusions) in thin steel plates. This is an example of flaw detection with a probe enclosed in a tire. The ultrasonic wave hits the metal plate obliquely and a plate wave is generated across the width of the plate. The reflected signal from the flaw is received and the flaw is detected.

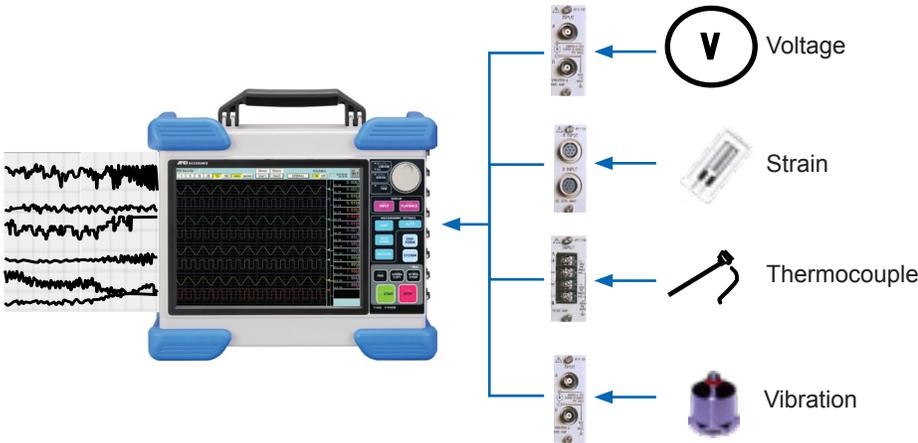


Recording Image of Deformed Bar Flaw Detection

This image shows the output record of an eddy current flaw detection device where two sensing coils are placed counteracting the nodes of the deformed steel bar and the difference in output is used to detect points of variation caused by flaws.



RA2000A Series Omniace III Digital Oscilloscope Recorder



Quality Control and Energy Saving in the Rolling Process



Recorders and Older Models

Rectiholv
8K20



Omniace Family
RT3200 RT2100



Rectigraph
8K40



RT3600



RT3424



Ultrasonic Testing (UT) and Acoustic Emission Testing (AT)

Ultrasonic flaw detection testing (UT) detects internal flaws with ultrasonic waves using the same principle as active sonar (internal faults are detected by transmitting ultrasonic waves and receiving reflected echoes from the internal defect). Acoustic emission testing (AT) uses the same principle as passive sonar (it detects ultrasonic waves generated from internal defects during growth).

UT is generally used for detecting internal defects in steel plates and steel pipes. In the UT method, in order to detect defects at a more accurate position, the phased array method in which a large number of transducers are arrayed and an arrangement in which the transmitting probe and the receiving probe are arranged in a face-to-face manner as well as the diffracted wave generated by the defect are used. The TOFD (Time of Flight Diffraction) method is also used from the flaw detection image.

Did You Know?

The RA Series (RA2300MKII pictured upper left) simultaneously measures voltage, current, control timing, vibration, rotation, pressure and thermocouples directly from sensors. HDD data recording and higher process computer communication is possible.