

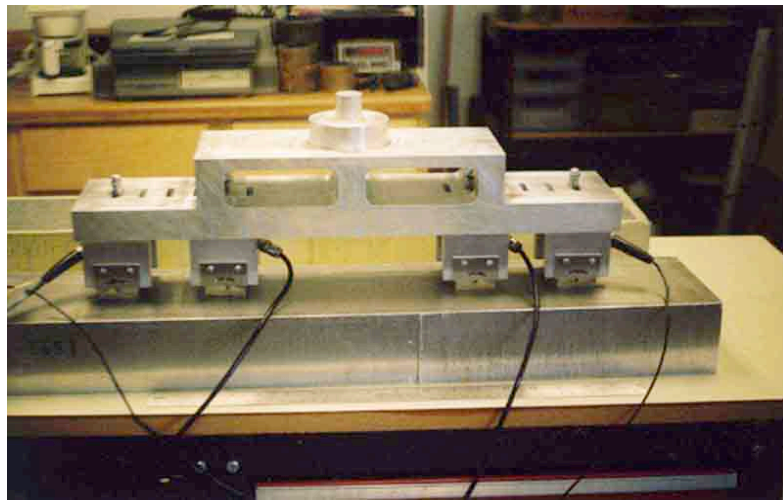
Dual Axis Version of L_{CR} Stress Measurement Probe

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The latest version of the L_{CR} ultrasonic stress measurement probe was manufactured for an aluminum plate rolling plant in the United States. This 0.53 m (21 in.) long probe, shown below, has dual axis, patented probe rotation assuring minimum travel-time error caused by variations in couplant thickness and probe spacing. Multiple receivers may be used at different locations for increased flexibility in stress field analysis.



Repeatability tests were conducted in our laboratory where the testing involved full remove, clean and replacement. The results showed travel-time repeatability for the two-receiver probe arrangement to be 2 ns. This is equal to the performance previously reported for the smaller version of the probe (Bray, Don E., "Performance Comparison of Two L_{CR} Probes Using a Reference Frame," *Review of Progress in Quantitative Nondestructive Evaluation, Vol. 25B*, D. O. Thompson and D. Chimenti, Eds. August 2005, Brunswick, Maine, pp. 1442-1449).

The 2ns travel-time resolution enables stress resolution of 500 psi in aluminum. Instrumentation requirements range from a typical digital ultrasonic flaw detector such as an Epoch IV to a lunch box computer with a high speed digitizing card and L_{CR} StressMap software. The probe has been at the user's plant for over a year, and this same high level of repeatability is being regularly achieved.

