AEC-NASA TECH BRIEF

Acoustic Emission Used As Weld Quality Monitor

An acoustic emission technique has been demonstrated as a quality control tool in the non-destructive inspection of welds. Pressure waves released in the metal during deformation or fracture are detected and used to pinpoint weld defects.

Stress mounts around a weld defect until it exceeds the yield strength of the material. A pressure wave relieving the stress is emitted and followed by oscillations caused by multiple reflections within the welded metal material. The acoustic emissions are then detected by a sensor similar to an ultrasonic sensor.

The major advantage of the acoustic emission technique as opposed to other non-destructive techniques is that it provides real-time information on weld defects. Cracks, porosity and inclusions can be detected as the metal cools and corrective action taken immediately.

Acoustic emission monitoring can result in reduction of rework costs and improvement of weld quality when used to supplement established weld inspection methods. Knowledge of the time the weld defect occurs can more effectively determine the causes of the defect and result in more efficient manufacturing procedures. As such this information should be of interest to persons and industries doing extensive welding.

Note:

Requests for further information may be directed to:

Mr. Glenn K. Ellis
Technology Utilization Officer
Office of Information Services
U.S. Atomic Energy Commission
Washington, D.C. 20545
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Patent status:

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Mr. George H. Lee, Chief
Chicago Patent Group
U.S. Atomic Energy Commission
Chicago Operations Office
9800 South Cass Avenue
Argonne, Illinois 60439

Source: W.O. Jolly
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