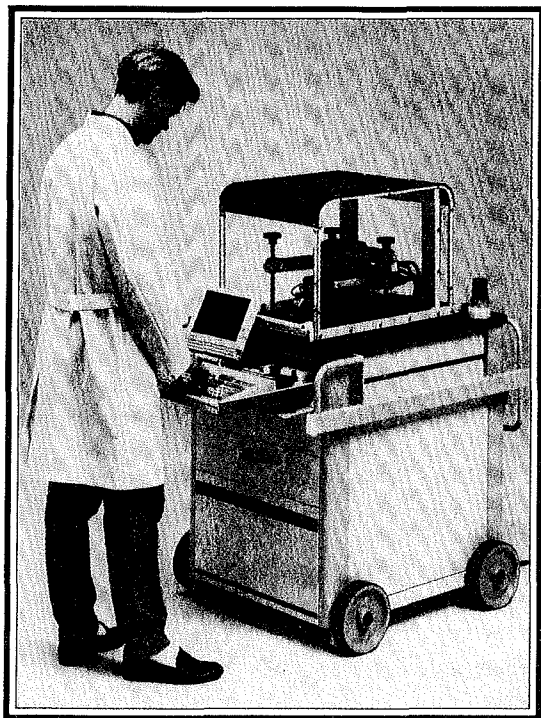


News Release

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AST X2002 STRESS ANALYZER OFFERS UNMATCHED PERFORMANCE

X-ray diffraction is the conventional and time proven technique for measuring residual stresses. Using the interatomic spacing as the ultimate gage length, x-ray technique is applicable to all crystalline materials and can measure absolute stress without the need of an unstressed sample for calibration.

American Stress Technologies has introduced AST X2002, a second generation x-ray stress analyzer, based on solid state photodetector technology.

Design objectives for AST X2002 were determined by the growing need for higher control of residual stresses in modern manufacturing industries. The goal was to create an x-ray stress analyzer that would be: (i) portable enough for field applications, (ii) fast, safe and flexible enough for shop floor applications, and (iii) sophisticated and accurate enough for the most demanding research applications.

To achieve these objectives, several innovative technologies were developed. Extensive research and development work led to a patented direct exposure photodetector technique in which x-rays are directly recorded by ultramodern position-sensitive solid state photodetector arrays similar to those used in high resolution video imaging, eliminating bulky proportional counters, scintillation detectors, photomultipliers and optical fibers. These photodetectors are fast enough to record diffraction peaks in a few seconds, considerably reducing the time required for a measurement cycle.

The ultra-compact, lightweight goniometer design provides maximum portability and offers facilities for single, double and multiple inclinations of the incident beam, as well as for retained austenite testing. Thanks to the small size of the

goniometer, testing inside rings and tubes as small as 155 mm in diameter is possible. Stress measurements are also possible on the face and root areas of gears in either direction without removing a tooth. In the standard configuration, the compact goniometer is used in vertical and upside-down position. Custom goniometers and fixtures are available to enable use of the measurement head in robots, or to adapt it for testing special component designs.

Diffraction peak shifts are determined from the line intensity profiles using combined cross-correlation and parabola fit methods, providing high accuracy and repeatability. The cross-correlation method is especially useful when testing ill-defined or asymmetrical diffraction peaks.

All functions of X2002 are controlled by a powerful Intel 80386 microcomputer. The standard software package includes all control and data reduction routines. Custom/optional software is available for special applications.

A large electroluminescent flat panel is used for data display. Only 70 mm deep, this panel offers brightness and resolution comparable to a CRT screen. The display not only facilitates communication between the operator and microcomputer, but also shows relevant intensity and cross-correlation profiles during the measurement cycle.

Storage and print-out capability of all key data including intensity profiles is included. Communication with any other computer is provided by a standard RS232 port.

With modern component and computer technology, a high degree of automation and ease of service is achieved. No special operator skills are required in routine testing, while X2002 has the sophistication for most demanding research applications.

X2002 is configured as an integrated all-in-one cart which is considerably smaller than the conventional modular "portable" systems. The rugged, wheeled cart houses microcomputer, keyboard, display panel, control unit, power sources, cooling system, printer and storage compartment. The cart serves as platform for the goniometer during transportation and measurement.

X2002 has been carefully designed and fabricated to meet all industrial safety standards for open beam x-ray operation. A number of safety interlocks are incorporated and a Plexiglass enclosure protects the operator whenever operating the goniometer "stationary" with the central unit. The low power x-ray tube further reduces any radiation leakage under open beam operation.

X2002 provides a unique combination of portability, mechanical simplicity, high speed and accuracy. The system is versatile, simple to use and capable of testing the most difficult materials.

Its design is based on years of experience which AST gained in field testing of its first generation unit; its technical excellence is backed up by AST application support, training and service.

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