

# Shear Stress Measurement with Portable X-ray Device

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The use of portable X-ray stress analyzers, which utilize an area detector along with the newly adopted  $\cos\alpha$  or full-ring fitting method, has recently attracted increasing interest. These measurements are fast, convenient, and precise in laboratory conditions because they employ a single-expose technique. Authors have previously reported the precision and accuracy of the stress measurement via in-situ uniaxial tensile loading tests, and quantified the measurement conditions which provide most precise and accurate results. To further explore applicability in multi-stress states including shear stress, pure torsion and mixed tension/torsion modes were applied to the hollow tube sample while recording/analyzing diffraction signals from the portable X-ray device. Stress values obtained from the stress analyzers will be compared with the applied (known) stress values.