

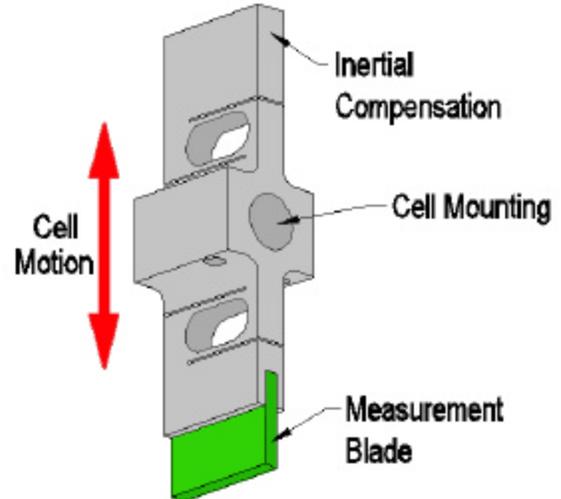


# A Problem Solver Application Bulletin

## Measuring Spring Rate in the Die

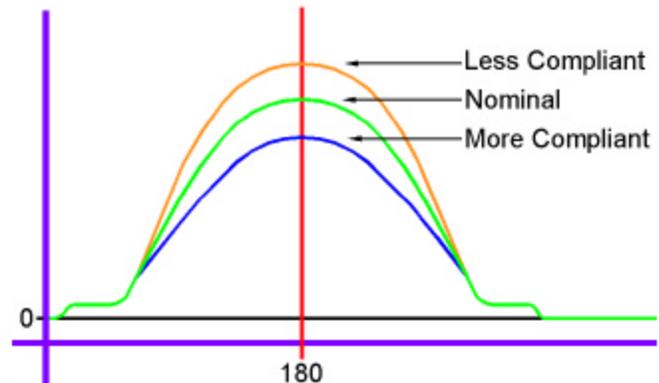
The **Signature Technologies SA-2000 “SAM”** module, and **Signature Technologies “SamView™”** Software package can be used to measure the rate of force change versus component displacement of specific features on manufactured parts such as connector parts or small contacts. High speed is a natural for this application. This application can also verify insertion force.

Instead of sampling selected parts using an off-line gaging fixture, the illustrated method can perform the same type of test every stroke of the machine so that each part can be individually verified as having the proper dynamic characteristics. FOR EXAMPLE the individual keys on a keyboard could be tested for compliance to a given “feel” specification. The load cell shown with modification can be used in insertions tests for connectors.



The system works by compressing, or deflecting the element to be tested with a load cell specifically designed for the purpose. The illustration is of a cell designed to measure the “rate” of spring or flexure components. The load cell is attached to an oscillating mechanism (possibly the forming press slide), and the **SAM™** module captures the force information as the test piece is deflected. It can also be used for Insertion / withdrawal force measurements.

The measurement can either be calibrated, or comparative depending on the application. Calibrated measurements will give the force vs. flexure displacement of the test piece at the testing point. Post processing can be done to supply slope and spring rate information. Inertial compensation is used for high-speed oscillatory service to eliminate inertial forces from the measurement. In slow applications the inertial compensation is not required.



Multiple sensors can be used in cases where there are several different features to measure, or where multiple measurements are required to insure proper formation of a single feature. The **SAM™** module can handle inputs in groups of 8 up to 56 total points.

**Signature Technologies** can supply a wide variety of solutions to various manufacturing process problems dealing with measurement, verification of properties, tool condition, and machine health. We can also “close the loop” by performing process adjustments in response to specific variations in force, location, or shape of the work piece, as well as more simple controls which can track and reject specific parts which don’t meet specific quality criteria.

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