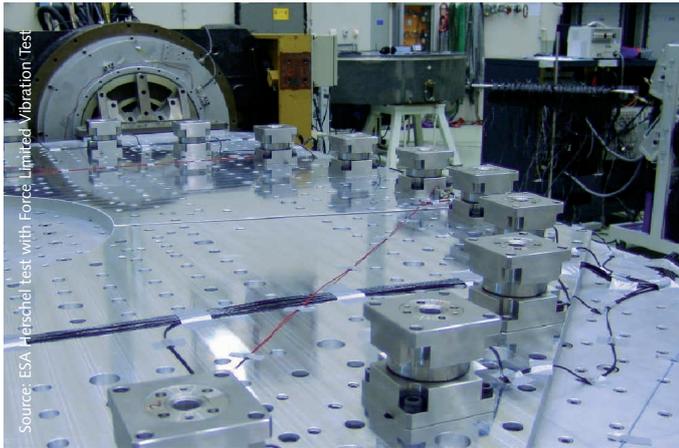


Application Focus: Force Limited Vibration Testing in the Space Industry.



Source: ESA - Fieschel test with Force Limited Vibration Test

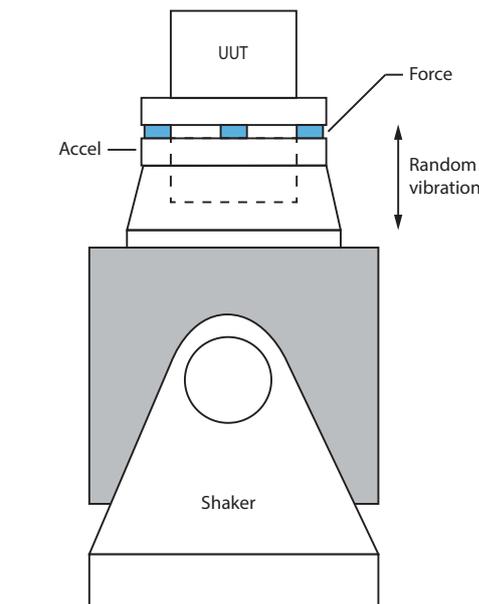
3-component force links mounted on base plate connected to the shaker

Force limiting provides a rational and economical solution to the over-testing problem associated with hard mounting of the test item, which has troubled aerospace vibration test engineers for decades. Back in the 90s, Kistler was a pioneer in supporting the Jet Propulsion Laboratory while developing these revolutionary techniques.

During the Force Limited Vibration Test, acceleration at the specimen mounting interface is usually controlled. To prevent destruction of the specimen when resonance frequencies are reached, the forces and moments must be monitored. To measure these forces, space customers may use Kistler force links, such as the triaxial load cell Type 9027C or Type 9327C Force Link, integrated between the satellite adapter and shakers. In case of structural resonances, the input force is limited to protect the structure against overloads. The charge outputs from the load cells allow for dynamic calculations of signals prior to any voltage conversion.

The signal is then conditioned by charge amplifiers where the entire range of the sensor can be exploited by selecting the right capacitor. Dedicated PC software allows these charge amplifiers to be easily controlled. The output of the charge amplifiers are then combined in real-time by a computing unit generating three forces and three moments. These force signals are then fed to the vibration control console along with the directly measured acceleration signals in order to control the shaker excitation level.

For more information please refer to the Special Print K20.310 at www.kistler.com or contact Kistler directly.



A force ring is mounted to this load cell, sandwiched between a top and bottom ring. The space payload is mounted on the top ring for the Force Limited Vibration Test