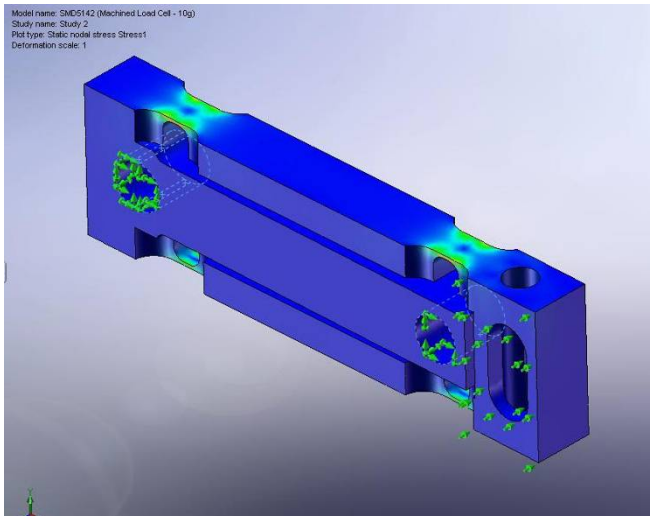
Application Notes on Resolution and Accuracy



Accuracy and resolution are two different animals. Resolution deals with the lowest force or voltage detectable, accuracy means resolving that detected force and reliably normalizing it to an (international) standard.

In order to resolve a force via a loadcell one must be able to see a measurable voltage change on an instrument. This may not include all thermal and mechanical errors but may merely be a repeatable event in a lab or other controlled environment. With modern laboratory voltmeters it is fairly easy to "resolve" a microvolt. With a load cell or strain gaged sensor excited at 10V for example and with a 2mv/V output that means you can see a part in 20,000, or 1 microvolt in 20 millivolts of output. Similarly for a 1 mV/V output you would get 10 millivolts outs with 10V excitation and resolve a microvolt as before yielding a part in 10,000 resolution. This means that a 10 gram S256 can resolve a milligram under these circumstances.

Accuracy involves full consideration of temperature and mechanical effects. If you are isothermal then you need not consider thermal effects but mechanical errors won't go away. You still have to

consider Linearity, Hysteresis and Non-Repeatability. For these reasons we "typically" quote accuracies in the region of a part in two thousand, or .05% or say 10 microvolts with a signal of 2mV/V. For example a 10 gram sensor with an output of 1mV/V might give accuracies to 5

microvolt or 5 milligram. Do a little filtering, averaging and control the loading conditions and you can obtain better accuracies.

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