



Measurement Description:

A 48 straw mechanical module was assembled with all the same parts and materials planned for a real module.

The module was mounted in the prototype frame with one frame end shimmed out by .5 mm. The frame is .4 mm longer than the module thus the module was stretch .9mm from its original length. It is clear from observing the "tufting" of the module sitting on the assembly fixture that straws are not straight in the 0 stretch condition. Thus some portion of the .9 mm stretch is due to straw straightening rather than actual straw elongation.

The edge of 5 straws were measured with a camera on a CMM with the straw plan in 3 orthogonal orientations. The entire straw could not be measured in the vertical position because of the height limit of the CMM. The repeatability of any measurement is +/- .025 mm

After the first three measurements additional shim was inserted to increase the stretch to 1.85 mm. The three measurements were repeated.

The coordinate system for the measurement was established from (2) tooling ball at one end of the frame. The measurement data is plotted after subtracting the nominal spacing of the straws and rotating the coordinate system to align the ends of straw 8 (closest to the center) with the horizontal axis.

Conclusions: The increase in straw tension does not dramatically improve the "tufting" of the straw module. This tufting may be due to form deviations (roundness and straightness) of the straws or end constraints at the module ends or some combination of the two. Further investigation is required including measuring individual straws to establish the form of a typical straw.