

Report of Special Test
PC-DMIS 4.3
Wilcox Associates, Inc.

The reported uncertainty is the combined effects of the statistical uncertainty of estimating the root mean square (RMS) value from a sample of fitting problems, and the uncertainty of the reference fits. While these uncertainties were calculated by 30 data sets per geometry type, a user must recognize that such uncertainty figures are not necessarily supported by a historical, long-term database. The standard uncertainties are reported, meaning that the uncertainties are reported using a coverage factor of $k = 2$, (see references 4, 8). While the coordinates in the test data sets are in millimeters, the results are reported in micrometers for lengths and arc seconds for angles. The values reported in this Report of Special Test apply to the software tested only in the computing environment in which it was tested. NIST cannot guarantee that the user's software will have the same value as reported by NIST when used in another facility at a later date.

The test conditions, particularly the specifications for the test data sets, comply with the default test specified in Standard ASME B89.4.10 (Reference 1). Some conditions are summarized as:

Sampling strategy	Points were regularly spaced over the sampling region.
Measurement error	Uniformly random measurement error simulations were included.
Form errors	Several errors specified in the standard, including bends, sinusoidal, step errors, tapers, etc.
Range of part size	1 mm – 500 mm.
Part origin	Within 1000 mm of coordinate system origin.
Aspect ratios	Planes: maximum length:width ratio was 50. Cylinders and Cones: aspect ratios between 0.02 and 10.
Partial features	Circles: arcs as small as 90 degrees. Spheres: hemispheres, 90 degree polar patches, 30 degree bands. Cylinders and Cones: 90–360 degree sweeps.

The test data sets were generated without the need for seed values. Thus the order of the data points in the test data sets was not rearranged to fit any special software requirements.

This Special Test was carried out as follows: NIST generated data sets simulating the ranges of test conditions described above in accordance with the ASME B89.4.10 standard. NIST also generated reference fit results using NIST's Algorithm Testing System internal algorithms. The customer received the NIST-generated data sets in ASCII format and generated corresponding fit results using the software under test. NIST then compared each of the customer's fits to the