



Measurement System Analysis - Gauge Repeatability & Reproducibility Study

Executive Summary

Level 3 Inspection has performed a complete Gauge Repeatability Study for 575-0506-3209 White Light Scanner in accordance with the Anova Gage R&R method. Level 3 Inspection has over 30 years combined experience using [White Light Scanners](#) to acquire data on the most complex and challenging parts in the world. This data is used to dimensionally verify hardware in all disciplines using Computer Aided Inspection. This work was performed under Internal Purchase Order Number 575-0506-3209 dated 10/11/2017.

Sample Size and Description

Conduct R&R studies on certified standards, traceable to NIST to show measurement accuracy and uncertainty. Quantify measurements of these standards using SVS Comet Inspect, Geomagic and other geometric measurement tools as applicable. Correlate data collected on actual hardware to show measurement variation and accuracy.

NIST Traceable Standards to be measured:

- 0.100" SS Bar – 821/268634-03 (070508)
- 1.000" SS Bar – 821/276375-08 (081214)
- 4.000" SS Bar – 821/276375-08 (072015)
- 7.000" SS Bar – 821/268634-03 (010177)
- 2.000" Ti Sphere – 0408093 HH Lot: 75998

WLS measuring volumes to be used in data collection:

- 575-0506-3209 / C050mm Measuring Volume
- 575-0506-3209 / C100mm Measuring Volume
- 575-0506-3209 / C200mm Measuring Volume

Summary of Findings

Level 3 Inspection finds the 575-0506-3209 White Light Scanner to perform well within the limits set forth for accuracy and repeatability. This White Light Scanner is capable of measuring any feature on any part with the same or better accuracy than any other measurement method.

FOV/Block Size	Bias	Accuracy	Repeatability+Bias % at 0.00005"	Standard Deviation
C050/0.100	0.00000400	0.00008130	16%	0.00001447
C050/1.000	0.00000278	0.00005285	11%	0.00000969
C050	0.00000339	0.00006708	13%	0.00001208
C100/1.000	0.00001002	0.00006780	14%	0.00001052
C100/4.000	0.00000473	0.00007645	15%	0.00001344
C100/2.000 Sphere	0.00000136	0.00002895	6%	0.00000547
C100	0.00000537	0.00007213	12%	0.00000981
C200/4.000	0.00000136	0.00009290	19%	0.00001755
C200/7.000	0.00000300	0.00010040	20%	0.00001833
C200/2.000 Sphere	-0.00000168	0.00003180	6%	0.00000596
C200	0.00000089	0.00009665	15%	0.00001395
Overall	0.00000322	0.00007862	13%	0.00001195