

Example – Determining Bias by Control Chart Method

		Reference Value = 6.00	Bias
	1	5.8	-0.2
	2	5.7	-0.3
	3	5.9	-0.1
T	4	5.9	-0.1
R	5	6.0	0.0
I	6	6.1	0.1
A	7	6.0	0.0
L	8	6.1	0.1
S	9	6.4	0.4
	10	6.3	0.3
	11	6.0	0.0
	12	6.1	0.1
	13	6.2	0.2
	14	5.6	-0.4
	15	6.0	0.0

Bias study data

Referring to the above table, the stability study was performed on a part which had a reference value of 6.01. The overall average of all the samples (20 subgroups of size 5 for $n=100$ samples) was 6.021. The calculated bias is therefore 0.011.

Using a spreadsheet and statistical software, the supervisor generated the numerical analysis

	n	Mean, \bar{X}	Standard Deviation, σ_r	Standard Error of Mean, σ_s
Measured Value	100	6.021	.2048	.02048

	Reference Value = 6.01, $\alpha = .05$, $m = 5$, $g = 20$, $d_2^* = 2.334$, $d_2 = 2.326$					
	t statistic	df	Significant t value (2-tailed)	Bias	95% Confidence Interval of the Bias	
					Lower	Upper
Measured Value	.5371	72.7	1.993	.011	-.0299	.0519

Analysis of Stability Study for Bias