

MW-82 PCE

General Statistics

Total Number of Observations	7	Number of Distinct Observations	6
		Number of Missing Observations	0
Minimum	1.1	Mean	1.386
Maximum	1.8	Median	1.4
SD	0.227	Std. Error of Mean	0.0857
Coefficient of Variation	0.164	Skewness	0.845

Note: Sample size is small (e.g., <10), if data are collected using incremental sampling methodology (ISM) approach, refer also to ITRC Tech Reg Guide on ISM (ITRC 2020 and ITRC 2012) for additional guidance, but note that ITRC may recommend the t-UCL or the Chebyshev UCL for small sample sizes ($n < 7$). The Chebyshev UCL often results in gross overestimates of the mean. Refer to the ProUCL 5.2 Technical Guide for a discussion of the Chebyshev UCL.

Normal GOF Test

Shapiro Wilk Test Statistic	0.949	Shapiro Wilk GOF Test	
1% Shapiro Wilk Critical Value	0.73	Data appear Normal at 1% Significance Level	
Lilliefors Test Statistic	0.189	Lilliefors GOF Test	
1% Lilliefors Critical Value	0.35	Data appear Normal at 1% Significance Level	
Data appear Normal at 1% Significance Level			
Note GOF tests may be unreliable for small sample sizes			

Assuming Normal Distribution

95% Normal UCL		95% UCLs (Adjusted for Skewness)	
95% Student's-t UCL	1.552	95% Adjusted-CLT UCL (Chen-1995)	1.556
		95% Modified-t UCL (Johnson-1978)	1.557

Gamma GOF Test

A-D Test Statistic	0.219	Anderson-Darling Gamma GOF Test	
5% A-D Critical Value	0.708	Detected data appear Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.167	Kolmogorov-Smirnov Gamma GOF Test	
5% K-S Critical Value	0.311	Detected data appear Gamma Distributed at 5% Significance Level	
Detected data appear Gamma Distributed at 5% Significance Level			
Note GOF tests may be unreliable for small sample sizes			

Gamma Statistics

k hat (MLE)	45.43	k star (bias corrected MLE)	26.06
Theta hat (MLE)	0.0305	Theta star (bias corrected MLE)	0.0532
nu hat (MLE)	636.1	nu star (bias corrected)	364.8
MLE Mean (bias corrected)	1.386	MLE Sd (bias corrected)	0.271
		Approximate Chi Square Value (0.05)	321.5
Adjusted Level of Significance	0.0158	Adjusted Chi Square Value	309.2

Assuming Gamma Distribution

95% Approximate Gamma UCL	1.572	95% Adjusted Gamma UCL	1.635
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Lognormal GOF Test

Shapiro Wilk Test Statistic	0.974	Shapiro Wilk Lognormal GOF Test	
10% Shapiro Wilk Critical Value	0.838	Data appear Lognormal at 10% Significance Level	
Lilliefors Test Statistic	0.161	Lilliefors Lognormal GOF Test	
10% Lilliefors Critical Value	0.28	Data appear Lognormal at 10% Significance Level	
Data appear Lognormal at 10% Significance Level			
Note GOF tests may be unreliable for small sample sizes			

Lognormal Statistics

Minimum of Logged Data	0.0953	Mean of logged Data	0.315
Maximum of Logged Data	0.588	SD of logged Data	0.159

Assuming Lognormal Distribution

95% H-UCL	1.574	90% Chebyshev (MVUE) UCL	1.636
95% Chebyshev (MVUE) UCL	1.749	97.5% Chebyshev (MVUE) UCL	1.907
99% Chebyshev (MVUE) UCL	2.216		

Nonparametric Distribution Free UCL Statistics

Data appear to follow a Discernible Distribution

Nonparametric Distribution Free UCLs			
95% CLT UCL	1.527	95% BCA Bootstrap UCL	1.529
95% Standard Bootstrap UCL	1.517	95% Bootstrap-t UCL	1.6
95% Hall's Bootstrap UCL	1.717	95% Percentile Bootstrap UCL	1.514
90% Chebyshev(Mean, Sd) UCL	1.643	95% Chebyshev(Mean, Sd) UCL	1.759
97.5% Chebyshev(Mean, Sd) UCL	1.921	99% Chebyshev(Mean, Sd) UCL	2.239

Suggested UCL to Use

95% Student's-t UCL 1.552

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL. Recommendations are based upon data size, data distribution, and skewness using results from simulation studies. However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.