

Cole D PCE												
General Statistics												
Total Number of Observations				6	Number of Distinct Observations						6	
					Number of Missing Observations						0	
Minimum				12	Mean						18	
Maximum				26	Median						17.5	
SD				4.775	Std. Error of Mean						1.949	
Coefficient of Variation				0.265	Skewness						0.761	
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				0.966	Shapiro Wilk GOF Test							
1% Shapiro Wilk Critical Value				0.713	Data appear Normal at 1% Significance Level							
Lilliefors Test Statistic				0.171	Lilliefors GOF Test							
1% Lilliefors Critical Value				0.373	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				21.93	95% Adjusted-CLT UCL (Chen-1995)						21.85	
					95% Modified-t UCL (Johnson-1978)						22.03	
Gamma GOF Test												
A-D Test Statistic				0.175	Anderson-Darling Gamma GOF Test							
5% A-D Critical Value				0.697	Detected data appear Gamma Distributed at 5% Significance Level							
K-S Test Statistic				0.135	Kolmogorov-Smirnov Gamma GOF Test							

5% K-S Critical Value				0.332	Detected data appear Gamma Distributed at 5% Significance Level						
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Note GOF tests may be unreliable for small sample sizes											
Gamma Statistics											
k hat (MLE)				17.62	k star (bias corrected MLE)					8.922	
Theta hat (MLE)				1.022	Theta star (bias corrected MLE)					2.018	
nu hat (MLE)				211.5	nu star (bias corrected)					107.1	
MLE Mean (bias corrected)					18	MLE Sd (bias corrected)					6.026
						Approximate Chi Square Value (0.05)					84.18
Adjusted Level of Significance					0.0122	Adjusted Chi Square Value					76.87
Assuming Gamma Distribution											
95% Approximate Gamma UCL					22.89	95% Adjusted Gamma UCL					25.07
Lognormal GOF Test											
Shapiro Wilk Test Statistic					0.993	Shapiro Wilk Lognormal GOF Test					
10% Shapiro Wilk Critical Value					0.826	Data appear Lognormal at 10% Significance Level					
Lilliefors Test Statistic					0.138	Lilliefors Lognormal GOF Test					
10% Lilliefors Critical Value					0.298	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					2.485	Mean of logged Data					2.862
Maximum of Logged Data					3.258	SD of logged Data					0.262
Assuming Lognormal Distribution											
95% H-UCL					23.31	90% Chebyshev (MVUE) UCL					23.76
95% Chebyshev (MVUE) UCL					26.37	97.5% Chebyshev (MVUE) UCL					30
99% Chebyshev (MVUE) UCL					37.12						
Nonparametric Distribution Free UCL Statistics											

Data appear to follow a Discernible Distribution												
Nonparametric Distribution Free UCLs												
95% CLT UCL					21.21	95% BCA Bootstrap UCL					21.33	
95% Standard Bootstrap UCL					20.99	95% Bootstrap-t UCL					23.17	
95% Hall's Bootstrap UCL					26.93	95% Percentile Bootstrap UCL					21.17	
90% Chebyshev(Mean, Sd) UCL					23.85	95% Chebyshev(Mean, Sd) UCL					26.5	
97.5% Chebyshev(Mean, Sd) UCL					30.17	99% Chebyshev(Mean, Sd) UCL					37.4	
Suggested UCL to Use												
95% Student's-t UCL					21.93							
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.												