

Cole Steel (MW-12) Cis-1,2 DCE											
General Statistics											
Total Number of Observations					6	Number of Distinct Observations				5	
						Number of Missing Observations				0	
Minimum					7.4	Mean				13.87	
Maximum					18	Median				16	
SD					4.55	Std. Error of Mean				1.857	
Coefficient of Variation					0.328	Skewness				-0.891	
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					0.803	Shapiro Wilk GOF Test					
1% Shapiro Wilk Critical Value					0.713	Data appear Normal at 1% Significance Level					
Lilliefors Test Statistic					0.347	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					17.61	95% Adjusted-CLT UCL (Chen-1995)				16.2	
						95% Modified-t UCL (Johnson-1978)				17.5	
Gamma GOF Test											
A-D Test Statistic					0.769	Anderson-Darling Gamma GOF Test					
5% A-D Critical Value					0.698	Data Not Gamma Distributed at 5% Significance Level					
K-S Test Statistic					0.377	Kolmogorov-Smirnov Gamma GOF Test					

5% K-S Critical Value				0.333	Data Not Gamma Distributed at 5% Significance Level				
Data Not Gamma Distributed at 5% Significance Level									
Gamma Statistics									
k hat (MLE)				9.201	k star (bias corrected MLE)			4.712	
Theta hat (MLE)				1.507	Theta star (bias corrected MLE)			2.943	
nu hat (MLE)				110.4	nu star (bias corrected)			56.54	
MLE Mean (bias corrected)				13.87	MLE Sd (bias corrected)			6.388	
					Approximate Chi Square Value (0.05)			40.26	
Adjusted Level of Significance				0.0122	Adjusted Chi Square Value			35.36	
Assuming Gamma Distribution									
95% Approximate Gamma UCL				19.48	95% Adjusted Gamma UCL			22.17	
Lognormal GOF Test									
Shapiro Wilk Test Statistic				0.78	Shapiro Wilk Lognormal GOF Test				
10% Shapiro Wilk Critical Value				0.826	Data Not Lognormal at 10% Significance Level				
Lilliefors Test Statistic				0.364	Lilliefors Lognormal GOF Test				
10% Lilliefors Critical Value				0.298	Data Not Lognormal at 10% Significance Level				
Data Not Lognormal at 10% Significance Level									
Lognormal Statistics									
Minimum of Logged Data				2.001	Mean of logged Data			2.574	
Maximum of Logged Data				2.89	SD of logged Data			0.383	
Assuming Lognormal Distribution									
95% H-UCL				21.23	90% Chebyshev (MVUE) UCL			20.48	
95% Chebyshev (MVUE) UCL				23.44	97.5% Chebyshev (MVUE) UCL			27.54	
99% Chebyshev (MVUE) UCL				35.61					
Nonparametric Distribution Free UCL Statistics									
Data appear to follow a Discernible Distribution									

Nonparametric Distribution Free UCLs												
95% CLT UCL				16.92	95% BCA Bootstrap UCL						16.5	
95% Standard Bootstrap UCL				16.67	95% Bootstrap-t UCL						16.84	
95% Hall's Bootstrap UCL				15.7	95% Percentile Bootstrap UCL						16.67	
90% Chebyshev(Mean, Sd) UCL				19.44	95% Chebyshev(Mean, Sd) UCL						21.96	
97.5% Chebyshev(Mean, Sd) UCL				25.47	99% Chebyshev(Mean, Sd) UCL						32.35	
Suggested UCL to Use												
95% Student's-t UCL				17.61								
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.												
Note: For highly negatively-skewed data, confidence limits (e.g., Chen, Johnson, Lognormal, and Gamma) may not be reliable. Chen's and Johnson's methods provide adjustments for positively skewed data sets.												