SPC & Process Capability Study Report

1. Process / Machine / Study Location		2. Process / Machine Reference Numbers		3. People Performing Study / Measurement	
Process Name	Process X	Process ID	Mfg. Process XYZ	Study By	Joe Smith
Machine Name	Tool A	Machine ID	Machine ABC	Measured By	Joe Smith
Study Location	Company / Site A			Operator / Shift	

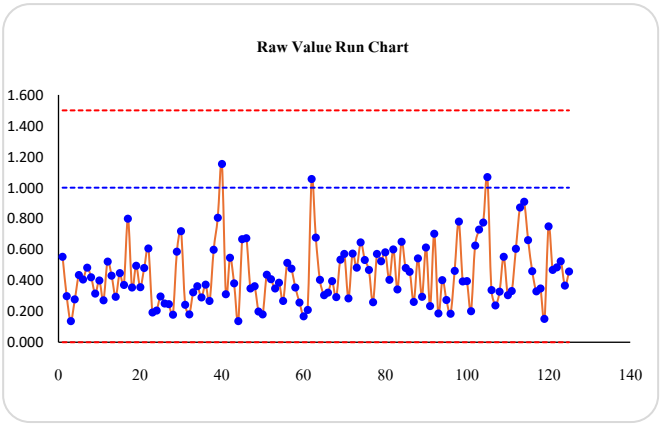
4. Data Collection Time & Duration		5. Part Name & Number		6. Characteristic / Specification Limits / Unit	
Study Date:	YEAR-MM-DD	Part Name	Widget A	Characteristic Name	Distance
Start	YYYY-MM-DD, hh:mm:ss,	Part Number	ID: 123456	Characteristic ID	ID=3
End	YYYY-MM-DD, hh:mm:ss	ECN	00	Class.	CC

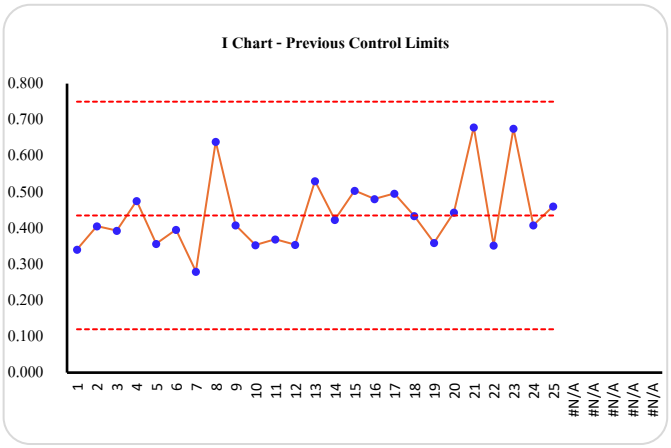
6. Specification Limits:		Study Information Input Data		Study Information Input Data	
LSL	0.000	Number of Subgroups (k)	25	Median	0.402
SL/Target	1.000	Subgroup Size (n)	5	Mean	0.440848
USL	1.500	Sample Size (N)	125	Distribution	Right-skewed
Unit:	mm	Sampling Strategy	Fixed	Quantile Method	

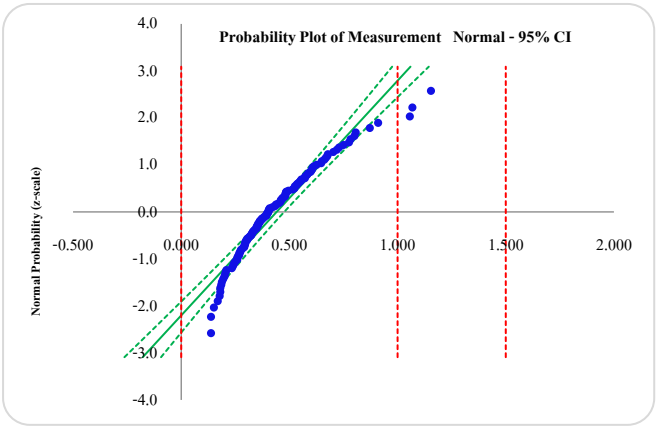
No	Date	Time	n										Mean/I	Range	SD	MR
			1	2	3	4	5	6	7	8	9	10				
1			0.554	0.299	0.138	0.277	0.436						0.3408	0.4160	0.1593	
2			0.407	0.483	0.420	0.316	0.400						0.4052	0.1670	0.0597	
3			0.272	0.522	0.431	0.295	0.448						0.3936	0.2500	0.1065	0.0644
4			0.372	0.800	0.355	0.496	0.357						0.4760	0.4450	0.1904	0.0824
5			0.481	0.607	0.194	0.206	0.296						0.3568	0.4130	0.1809	0.1192
6			0.251	0.246	0.178	0.587	0.719						0.3962	0.5410	0.2408	0.1192
7			0.243	0.180	0.324	0.363	0.291						0.2802	0.1830	0.0713	0.1160
8			0.373	0.268	0.598	0.806	1.154						0.6398	0.8860	0.3547	0.3596
9			0.311	0.547	0.381	0.137	0.667						0.4086	0.5300	0.2061	0.3596
10			0.674	0.348	0.363	0.199	0.181						0.3530	0.4930	0.1978	0.2868
11			0.438	0.408	0.349	0.385	0.267						0.3694	0.1710	0.0658	0.0556
12			0.514	0.477	0.355	0.258	0.168						0.3544	0.3460	0.1454	0.0164
13			0.209	1.057	0.678	0.404	0.305						0.5306	0.8480	0.3425	0.1762
14			0.322	0.395	0.292	0.535	0.571						0.4230	0.2790	0.1251	0.1762
15			0.284	0.575	0.482	0.646	0.533						0.5040	0.3620	0.1369	0.1076
16			0.468	0.259	0.571	0.524	0.582						0.4808	0.3230	0.1319	0.0810
17			0.404	0.601	0.342	0.650	0.481						0.4956	0.3080	0.1296	0.0232
18			0.456	0.262	0.542	0.294	0.614						0.4336	0.3520	0.1531	0.0620
19			0.234	0.702	0.187	0.402	0.273						0.3596	0.5150	0.2074	0.1360
20			0.185	0.462	0.782	0.394	0.395						0.4436	0.5970	0.2160	0.0840
21			0.202	0.625	0.729	0.775	1.068						0.6798	0.8660	0.3136	0.3202
22			0.337	0.238	0.327	0.553	0.305						0.3520	0.3150	0.1188	0.3278
23			0.332	0.605	0.872	0.910	0.661						0.6760	0.5780	0.2328	0.3278
24			0.460	0.330	0.349	0.151	0.750						0.4080	0.5990	0.2210	0.3240
25			0.469	0.485	0.525	0.366	0.458						0.4606	0.1590	0.0587	0.2680
26																
27																
28																
29																
30																

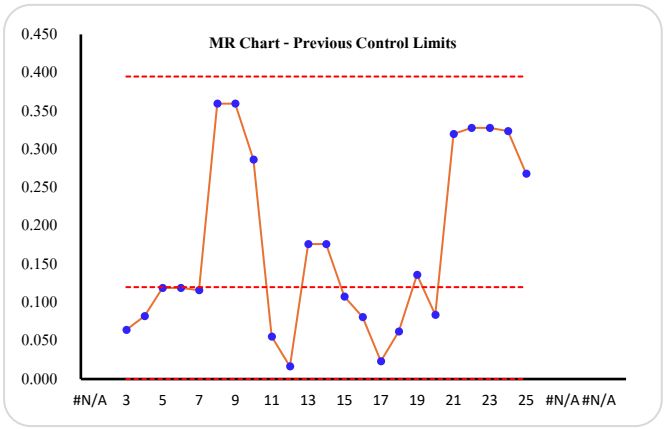
Control Chart Method : I-MR									
Chart / Component	Previous LCL	Previous CL	Previous UCL	Shewhart			AIAG & VDA SPC 1st		
				Current LCL	Current CL	Current UCL	Current LCL	Current CL	Current UCL
I Chart	0.120000	0.435000	0.750000	0.114806	0.440848	0.766890	**0.079873**	**0.444168**	**0.808463**
MR Chart	0.000000	0.120000	0.395000	0.000000	0.122592	0.400507	**0.007681**	**0.109734**	**0.543183**

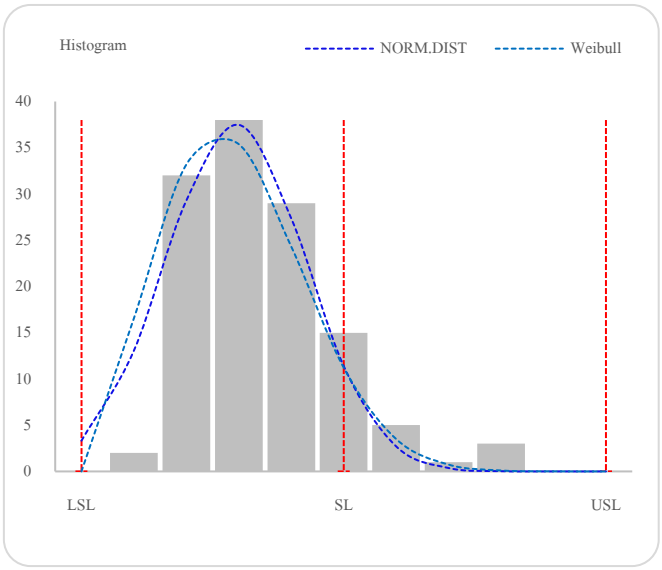
I-MR Calculation Check					Shewhart			AIAG & VDA SPC 1st			
Probability	**99.73%**	**MR Length (n)**	**3**	**d2**	1.128	**σ̂**	0.1097339734	**q**	0.9995496	**u(q)**	3.3198
α	0.0027	**1-α**	0.9973	**D3**	0.000	**D4**	3.267	**w(n; α/2)**	0.070	**w(n; 1-α/2)**	4.950











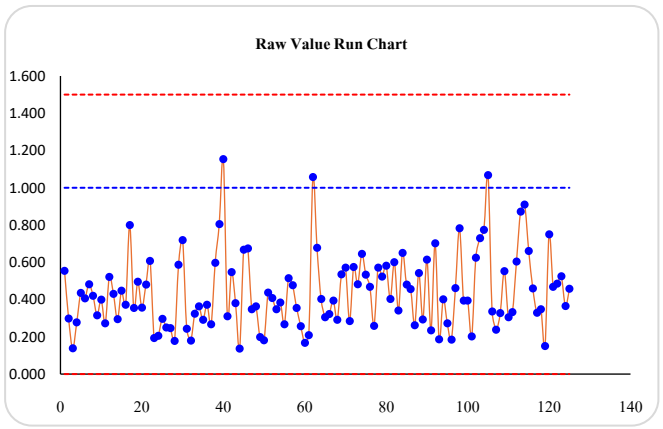
Method	Log-normal distribution	
	Parameter	Value
1	μln – Mean of ln(X)	-0.91841123
2	σln – SD of ln(X)	0.45297244
3	—	

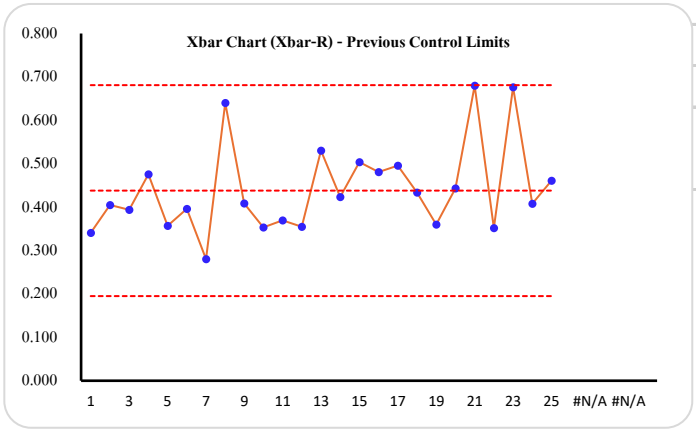
	X0.135%	**X50%**	**X99.865%**	
Value	0.10255782	0.3991527	1.55349323	
	PpL / CpL	**PpU / CpU**	**Pp / Cp**	**Ppk / Cpk**
Value	1.34578419	0.95365906	1.03381583	0.95365906
	pL	**pU**	**pTotal**	
Value	0.0000	0.0017	0.0017	
	95% CI	**95% CI**		
Value	0.40539932	0.47629668		

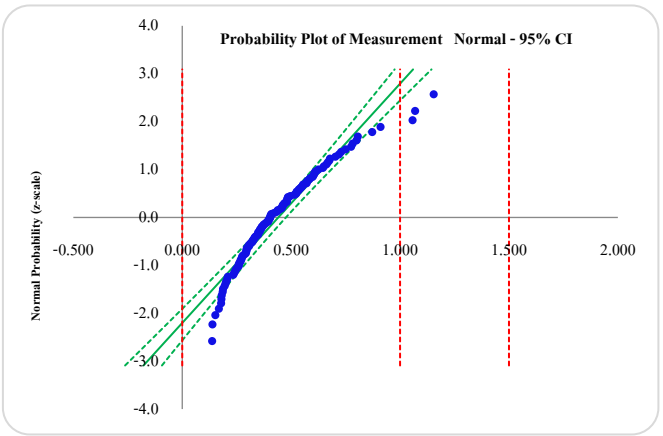
Control Chart Method : Xbar-R

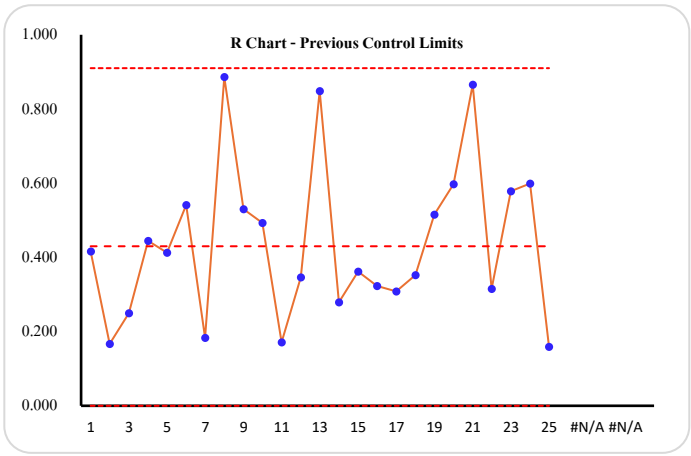
Chart / Component	Previous LCL	Previous CL	Previous UCL	Shewhart Current LCL	Shewhart Current CL	Shewhart Current UCL	AIAG & VDA SPC 1st Current LCL	AIAG & VDA SPC 1st Current CL	AIAG & VDA SPC 1st Current UCL
Xbar Chart	0.195000	0.438000	0.681000	0.188307	0.440848	0.693389	**0.188395**	**0.440848**	**0.693301**
R Chart	0.000000	0.430000	0.910000	0.000000	0.437680	0.925256	**0.074703**	**0.437680**	**1.011970**

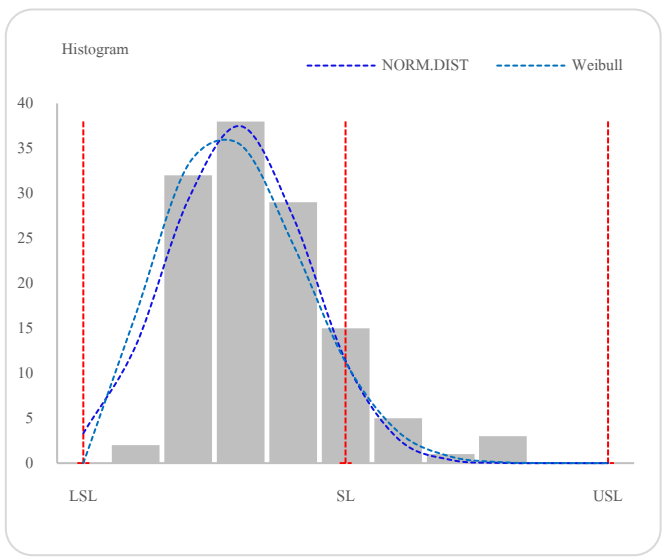
Xbar-R Calculation Check				Shewhart			AIAG & VDA SPC 1st			
Probability	99.73%	**Subgroup Size (n)**	5.000000	**A2**	0.577000		q = 1-α/2	0.998650	u(q)	2.999977
α	0.002700	**1-α**	0.997300	**D3**	0.000000	**D4**	2.114000	**d2**	2.326000	$\hat{\sigma} = \bar{R}/d2$	0.188169
								w(n; α/2)	0.397000	**w(n; 1-α/2)**	5.378000









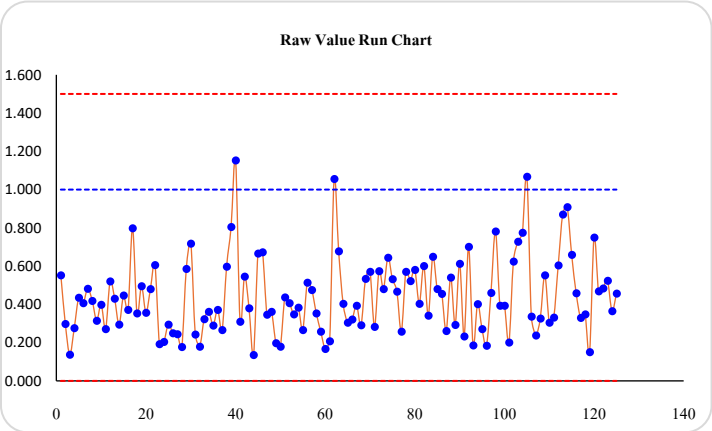


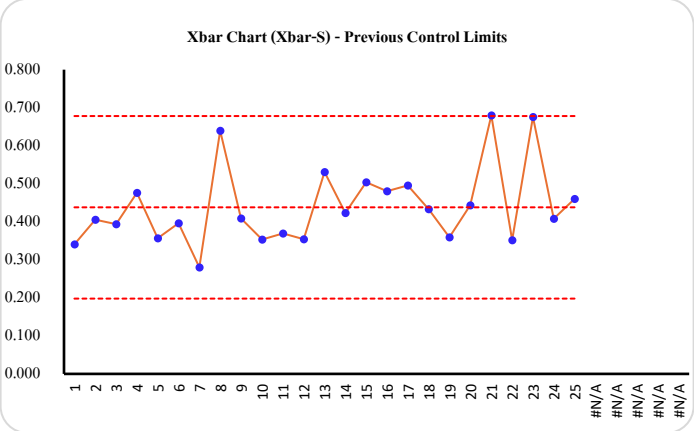
Method	Weibull distribution	
	Parameter	Value
1	ξ – Scale	0.49745657
2	β – Shape	2.35622513
3	γ – Location	0

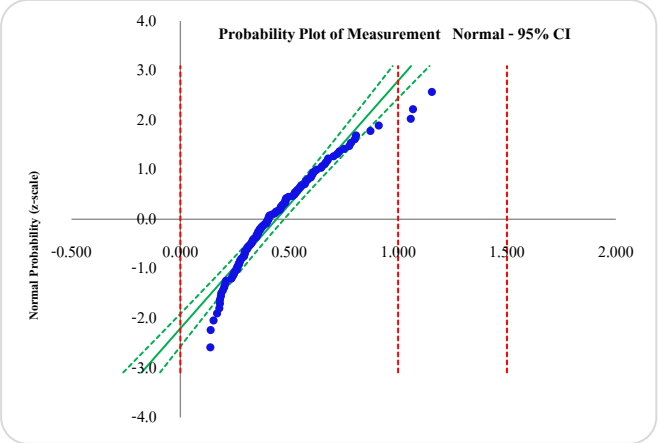
	X0.135%	X50%	X99.865%	
Value	0.03012807	0.42579473	1.10863717	
	PpL / CpL	**PpU / CpU**	**Pp / Cp**	**Ppk / Cpk**
Value	1.07614508	1.57313782	1.39080885	1.07614508
	pL	**pU**	**pTotal**	
Value	0.0000	0.0000	0.0000	
	95% CI	**95% CI**		
Value	0.40539932	0.47629668		

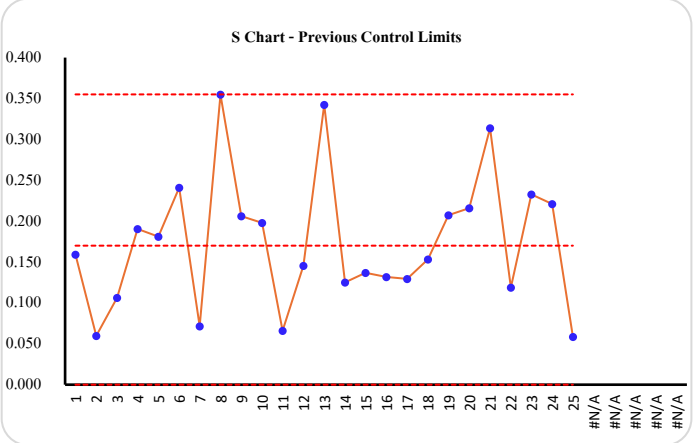
Control Chart Method : Xbar-S									
Chart / Component	Previous LCL	Previous CL	Previous UCL	Shewhart			AIAG & VDA SPC 1st		
				Current LCL	Current CL	Current UCL	Current LCL	Current CL	Current UCL
Xbar Chart	0.198000	0.438000	0.678000	**0.191644**	**0.440848**	**0.690052**	**0.183048**	**0.440848**	**0.698648**
S Chart	0.000000	0.170000	0.355000	**0.000000**	**0.174635**	**0.364812**	**0.031246**	**0.192154**	**0.405354**

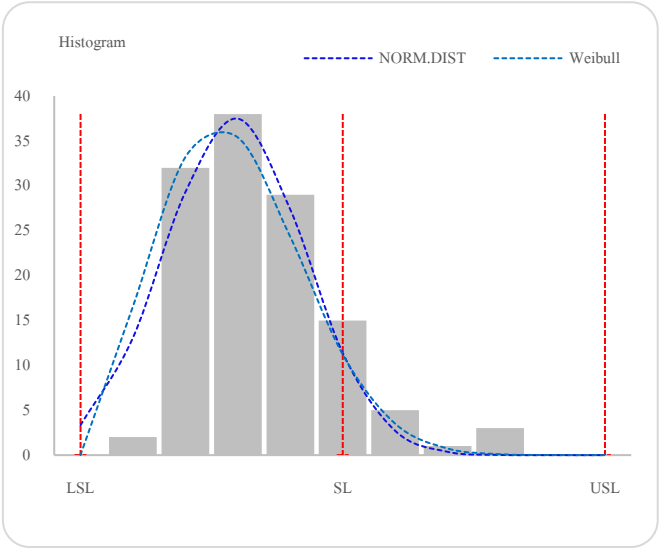
Xbar-S Calculation Check					Shewhart				AIAG & VDA SPC 1st		
Probability	99.73%			**A3**	1.427000	**c4**	0.940000	**q = 1-α/2**	0.998650	u(q)	2.999977
α	0.002700	**1-α**	0.997300	**B3**	0.000000	**B4**	2.089000	**Subgroup Size (n**	5.000000	df = n-1	4.000000
								χ^2(df; α/2)	0.105767	χ^2(df; 1-α/2)	17.800413











Method	Gamma distribution	
	Parameter	Value
1	α – Shape	4.84710141
2	β – Scale	0.09095085
3	—	

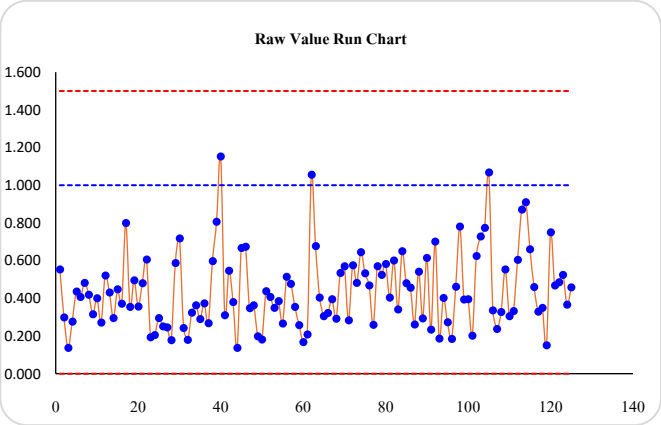
	X0.135%	X50%	X99.865%	
Value	0.06711586	0.41092992	1.2856533	
	PpL / CpL	**PpU / CpU**	**Pp / Cp**	**Ppk / Cpk**
Value	1.19520977	1.24504513	1.23098393	1.19520977
	pL	**pU**	**pTotal**	
Value	0.0000	0.0002	0.0002	
	95% CI	**95% CI**		
Value	0.40539932	0.47629668		

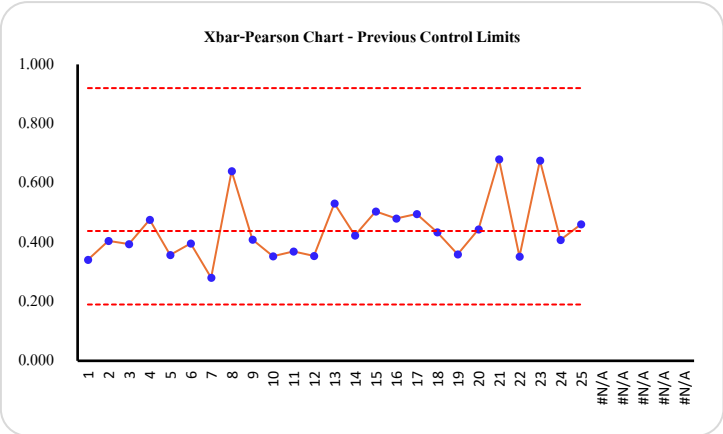
Control Chart Method : Pearson

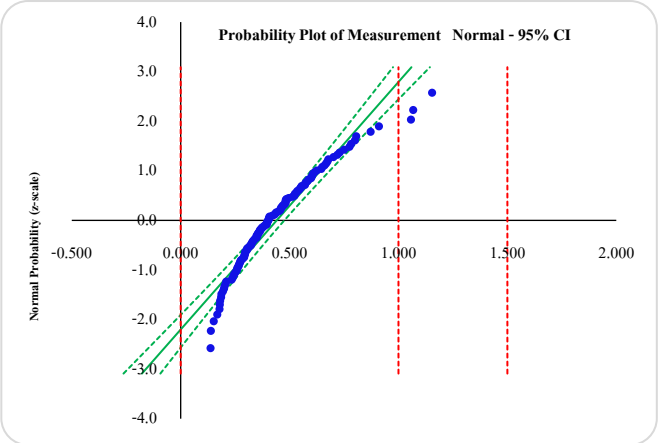
Chart / Component	Previous LCL	Previous CL	Previous UCL	Pearson Control Chart		
				Current LCL	Current CL	Current UCL
Xbar-Pearson Chart	0.190000	0.438000	0.920000	**0.183625**	**0.440848**	**0.937533**
s-Pearson Chart	0.000000	0.188000	0.393000	**0.000000**	**0.192154**	**0.401410**

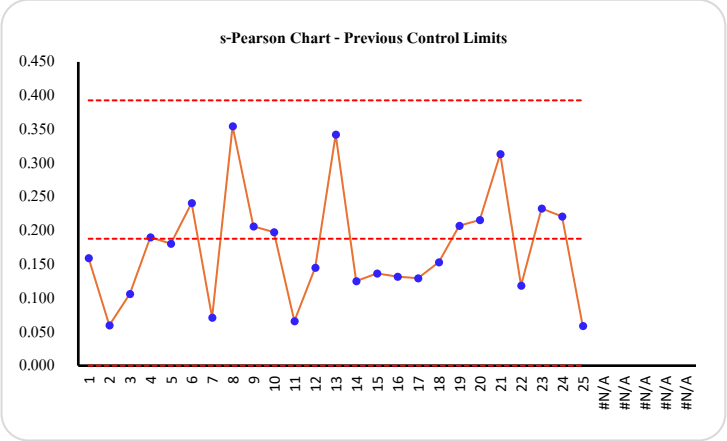
Pearson Calculation Check

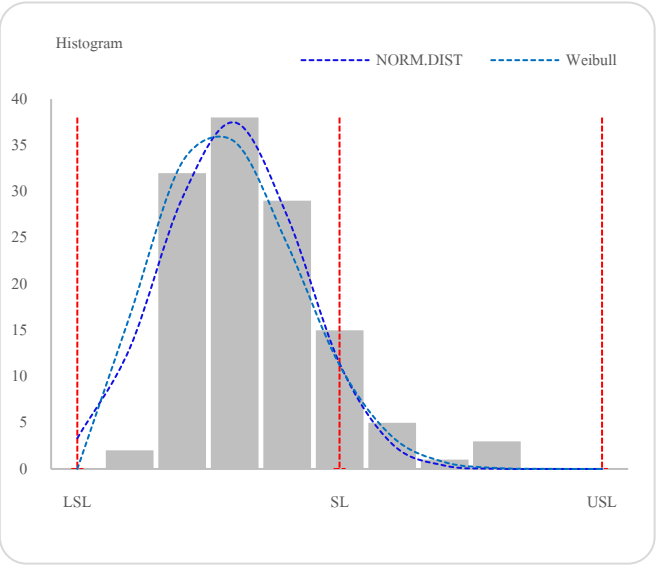
Subgroup Size (n)	5.000000	k	25.000000	Skewness γ_1	0.973377	Kurtosis β_2	3.185751	B3	0.000000	B4	2.089000
Average s^2	0.036923	$\hat{s}_{\bar{x}}$	0.103261	P0.135% (Table B.1	2.491000	P99.865% (Table B.2	4.810000				











Method	Out-of-Specification Proportion	
	Parameter	Value
1	Lower Fraction Nonconforn	0
2	Upper Fraction Nonconforn	0.00173538
3	Total Fraction Nonconforn	0.00173538

	zL	Center z=0	zU	
Value		0	2.92264213	
	PpL.Z	**PpU.Z**	**Pp.Z**	**Ppk.Z**
Value		0.97421404		0.97421404
	pL	**pU**	**pTotal**	
Value	0.0000	0.0017	0.0017	
	95% CI	**95% CI**		
Value	0.40539932	0.47629668		