Machine Performance 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 X		6. Specification Limits Y	
LSL	79.7500	LSL	-116.75
SL/Target	80.0000	SL/Target	-116.5
USL	80.2500	USL	-116.25
Unit:	mm	Unit:	mm

Machine Performance Database / Measurement Input

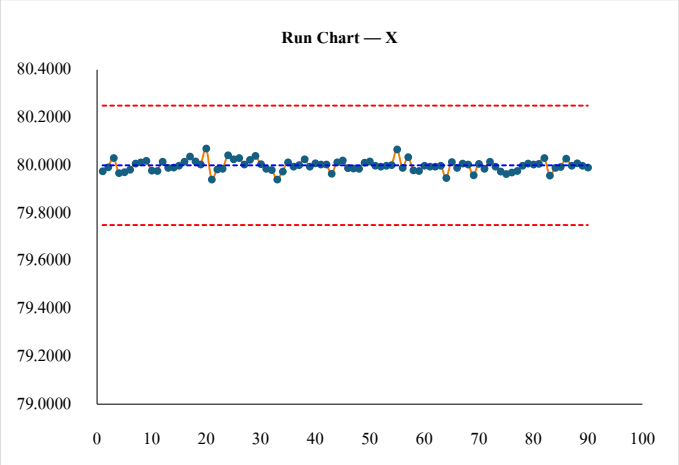
Part No	X	Y	dev. D	Part No	X	Y	dev. D	Part No	X	Y	dev. D	Part No	X	Y	dev. D
1	79.976	-116.47	0.038	31	79.986	-116.402	0.099	61	79.995	-116.42	0.080	91			
2	79.993	-116.406	0.094	32	79.982	-116.408	0.094	62	79.996	-116.367	0.133	92			
3	80.031	-116.42	0.086	33	79.942	-116.405	0.111	63	80	-116.412	0.088	93			
4	79.968	-116.475	0.041	34	79.975	-116.367	0.135	64	79.948	-116.406	0.107	94			
5	79.973	-116.399	0.105	35	80.014	-116.398	0.103	65	80.015	-116.4	0.101	95			
6	79.983	-116.41	0.092	36	79.995	-116.41	0.090	66	79.99	-116.42	0.081	96			
7	80.008	-116.401	0.099	37	80.002	-116.403	0.097	67	80.009	-116.413	0.087	97			
8	80.014	-116.415	0.086	38	80.027	-116.39	0.113	68	80.004	-116.433	0.067	98			
9	80.02	-116.428	0.075	39	79.995	-116.52	0.021	69	79.96	-116.376	0.130	99			
10	79.979	-116.427	0.076	40	80.01	-116.416	0.085	70	80.007	-116.379	0.121	100			
11	79.978	-116.44	0.064	41	80.005	-116.39	0.110	71	79.986	-116.394	0.107	101			
12	80.016	-116.416	0.086	42	80.004	-116.419	0.081	72	80.016	-116.429	0.073	102			
13	79.99	-116.434	0.067	43	79.966	-116.457	0.055	73	79.995	-116.431	0.069	103			
14	79.992	-116.38	0.120	44	80.013	-116.404	0.097	74	79.975	-116.395	0.108	104			
15	79.999	-116.397	0.103	45	80.021	-116.425	0.078	75	79.965	-116.387	0.118	105			
16	80.016	-116.382	0.119	46	79.989	-116.383	0.118	76	79.971	-116.382	0.122	106			
17	80.038	-116.423	0.086	47	79.988	-116.39	0.111	77	79.978	-116.383	0.119	107			
18	80.018	-116.383	0.118	48	79.987	-116.445	0.057	78	79.999	-116.382	0.118	108			
19	80.005	-116.384	0.116	49	80.012	-116.4	0.101	79	80.008	-116.477	0.024	109			
20	80.071	-116.406	0.118	50	80.017	-116.435	0.067	80	80.005	-116.406	0.094	110			
21	79.941	-116.458	0.072	51	80	-116.401	0.099	81	80.007	-116.444	0.056	111			
22	79.984	-116.404	0.097	52	79.995	-116.399	0.101	82	80.032	-116.413	0.093	112			
23	79.986	-116.475	0.029	53	79.999	-116.361	0.139	83	79.958	-116.368	0.139	113			
24	80.043	-116.418	0.093	54	80.002	-116.414	0.086	84	79.99	-116.378	0.122	114			
25	80.027	-116.538	0.047	55	80.068	-116.433	0.095	85	79.994	-116.374	0.126	115			
26	80.031	-116.415	0.090	56	79.99	-116.397	0.103	86	80.029	-116.416	0.089	116			
27	80.005	-116.403	0.097	57	80.035	-116.325	0.178	87	80	-116.39	0.110	117			
28	80.024	-116.38	0.122	58	79.98	-116.395	0.107	88	80.01	-116.417	0.084	118			
29	80.04	-116.43	0.081	59	79.978	-116.319	0.182	89	80	-116.379	0.121	119			
30	80.006	-116.406	0.094	60	80	-116.401	0.099	90	79.992	-116.369	0.131	120			

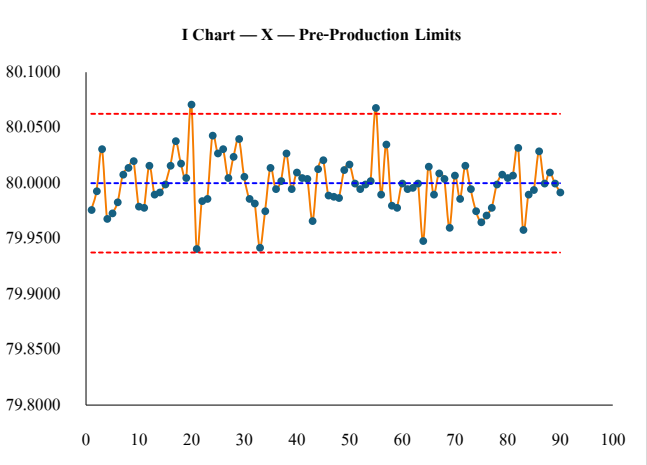
Univariate (X)

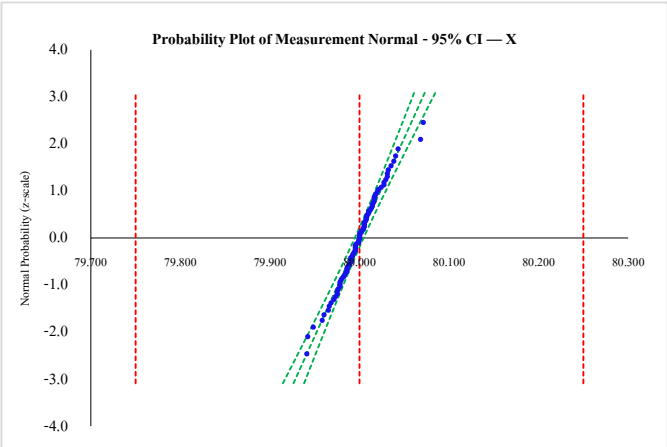
Chart / Component	Pre-Production Run (optional) Two-sided (±12.5% Tol) Pre LCL	Pre CL	Pre UCL	Shewhart Current LCL	Current CL	Current UCL	AIAG & VDA SPC 1st Current LCL	Current CL	Current UCL
I Chart	79.938	-	80.063	79.931	80.000	80.068	79.914	80.000	80.086
MR Chart	0.000	-	0.125	0.000	0.047	0.108	0.004	0.047	0.130

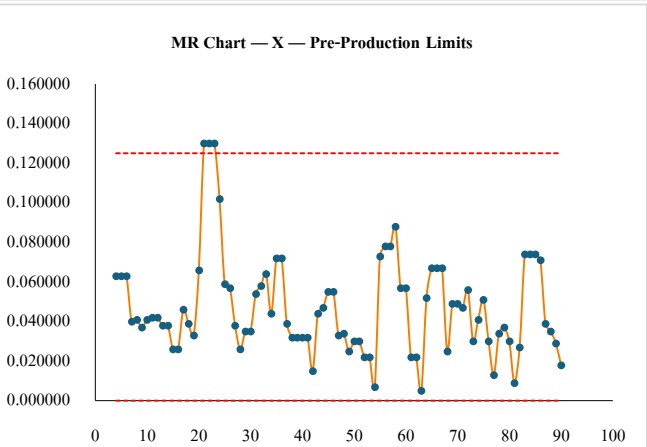
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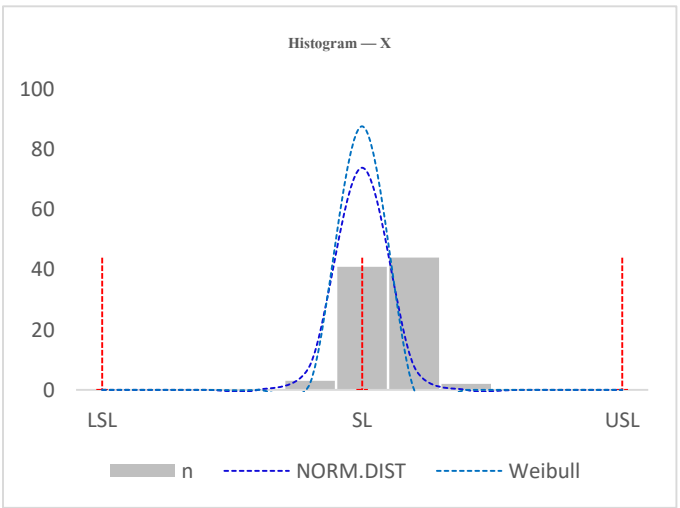
I-MR Calculation Check					Shewhart			AIAG & VDA SPC 1st			
Probability	99.90%	MR Length (n)	4	d2	2.059000	$\hat{\sigma}$	0.023452	q	0.999875	u(q)	3.662164
α	0.0010	1-α	0.999	D3	0.000000	D4	2.282000	w(n; α/2)	0.158000	w(n; 1-α/2)	5.553000











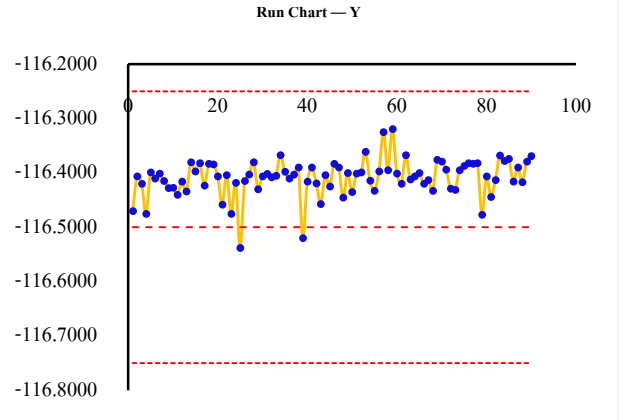
Method	Normal distribution	
	Parameter	Value
1	μ — Mean	79.999622
2	s — Sample SD	0.023722
3	—	

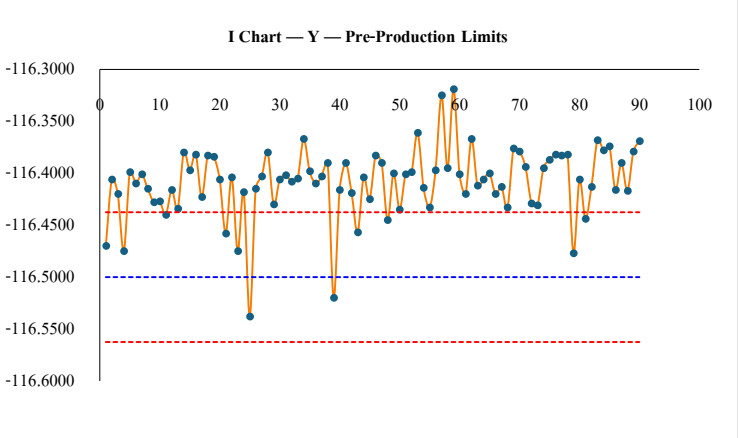
	X0.135%	X50%	X99.865%	
Value	79.928458	79.999622	80.070787	
	PmL	PmU	Pm	Pmk
Value	3.507679	3.518296	3.512987	3.507679
	pL	pU	pTotal	
Value	0.000000	0.000000	0.000000	
	95% CI μ	95% CI μ		
Value	79.994654	80.004591		

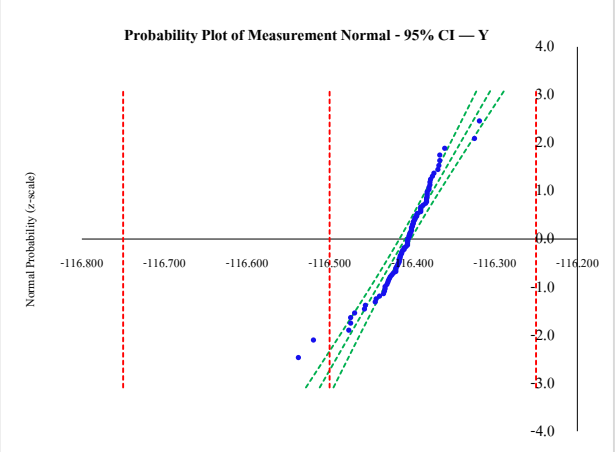
Univariate (Y)

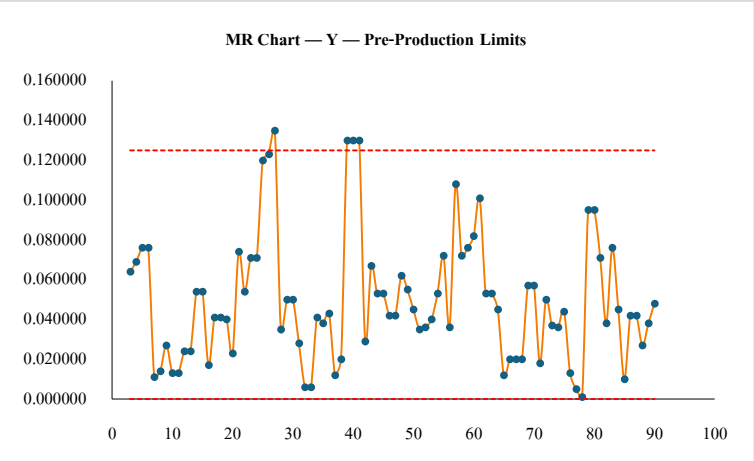
Chart / Component	Pre-Production Run (optional)			Shewhart			AIAG & VDA SPC 1st		
	Two-sided (±12.5% Tol)								
	Pre LCL	Pre CL	Pre UCL	Current LCL	Current CL	Current UCL	Current LCL	Current CL	Current UCL
Xbar Chart	**-116.563**	**-**	**-116.438**	**-116.497**	**-116.409**	**-116.321**	**-116.501**	**-116.409**	**-116.317**
R Chart	**0.000**	**-**	**0.125**	**0.000**	**0.050**	**0.128**	**0.004**	**0.050**	**0.139**

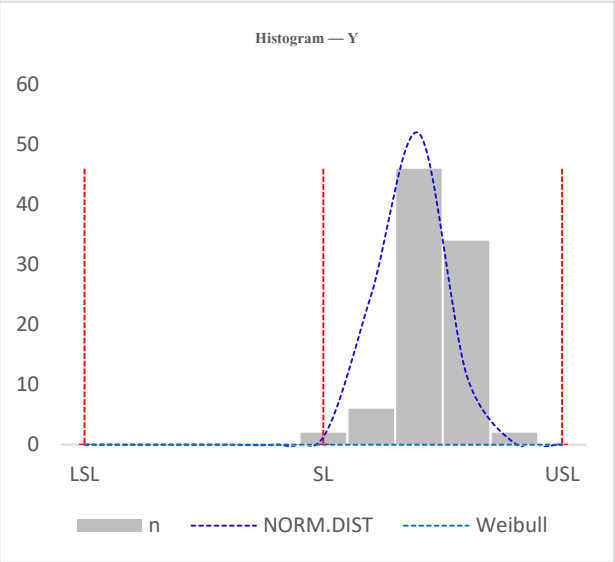
I-MR Calculation Check				Shewhart				AIAG & VDA SPC 1st			
Probability	**99.00%**	**MR Length (n)**	**3**	**d2**	1.693000	$\hat{\sigma}$	0.031333	**q**	0.998328	**u(q)**	2.934161
α	0.0100	**1-α**	0.99	**D3**	0.000000	**D4**	2.574000	**w(n; α/2)**	0.135000	**w(n; 1-α/2)**	4.424000











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

	Y0.135%	**Y50%**	**Y99.865%**
Value			

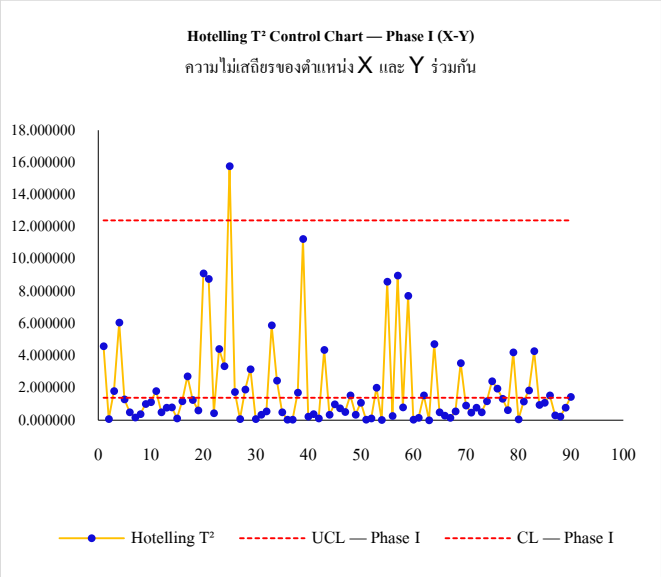
	PmL	**PmU**	**Pm**	**Pmk**
Value				

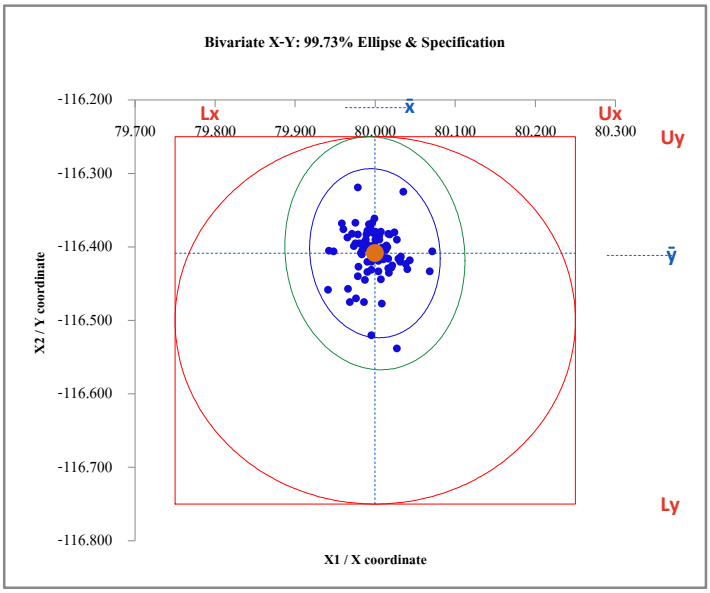
	pL	**pU**	**pTotal**
Value			

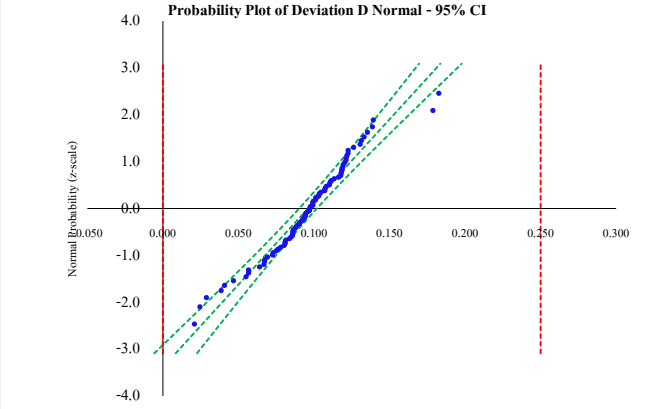
	95% CI μ	**95% CI μ**
Value	-116.4156	-116.4016

Bivariate (X–Y)

Chart / Component	Control Chart		
	Current LCL	Current CL	Current UCL
Hotelling T²	0.000000	1.391292	12.403170

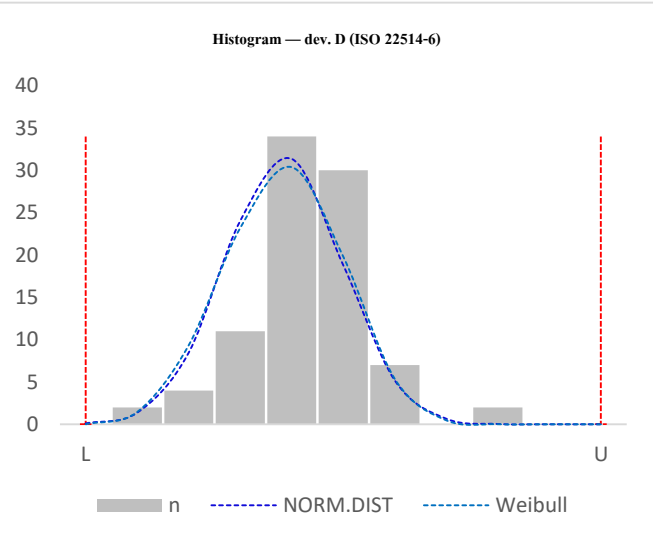






AIAG & VDA SPC 1st Edition ข้อ 7.5.2 — Bivariate Pm/Pmk

Bivariate X–Y	Rectangular
Acceptance Area (mm²)	0.250000
Pm — 7.5.2.2	2.358295
Pmk — 7.5.2.1	1.401107
p for Pm	1.000000
p for Pmk	0.999987
Geometry status	READY



ISO 22514-6 Type IIc — Deviation D Pm/Pmk

Method	Empirical Quantile			
	Parameter		Value	
1	— Sample size		90.000000	
2	Quantile rank			
3	Interpolation			
	D0.135%	**D50%**	**D99.865%**	
Value	0.021064	0.097075	0.181868	
	PmL	**PmU**	**Pm**	**Pmk**
Value	1.277126	1.803516	1.554696	1.803516
	pL	**pU**	**pTotal**	
Value	0.000000	0.000000	0.000000	
	95% CI μ	**95% CI μ**		
Value	0.090086	0.101961		