

Appendix I The linearity test of the incremental temperature differences for each collector

Regression Summary

Tdiff vs. 5 Independents

Inclusion criteria: Criteria 1 from Lcn-C1.svd

Count	2334
Num. Missing	0
R	.292
R Squared	.086
Adjusted R Squared	.084
RMS Residual	2.835

ANOVA Table

Tdiff vs. 5 Independents

Inclusion criteria: Criteria 1 from Lcn-C1.svd

	DF	Sum of Squares	Mean Square	F-Value	P-Value
Regression	5	1749.946	349.989	43.540	<.0001
Residual	2328	18713.286	8.038		
Total	2333	20463.233			

Regression Coefficients

Tdiff vs. 5 Independents

Inclusion criteria: Criteria 1 from Lcn-C1.svd

	Coefficient	Std. Error	Std. Coeff.	t-Value	P-Value
Intercept	1.166	.144	1.166	8.113	<.0001
Lcn2-3	.770	.203	.097	3.787	.0002
Lcn3-4	.365	.203	.046	1.797	.0725
Lcn4-5	1.601	.203	.202	7.877	<.0001
Lcn5-6	-.430	.203	-.054	-2.116	.0345
Lcn6-7	2.044	.203	.257	10.053	<.0001

Figure I-1 regression results for test of linearity for incremental temperature differences for Collector One in the temperature range 30°F to 50°F

Regression Summary**Tdiff vs. 5 Independents****Inclusion criteria: Criteria 2 from Lcn-C1.svd**

Count	11574
Num. Missing	0
R	.329
R Squared	.109
Adjusted R Squared	.108
RMS Residual	3.005

ANOVA Table**Tdiff vs. 5 Independents****Inclusion criteria: Criteria 2 from Lcn-C1.svd**

	DF	Sum of Squares	Mean Square	F-Value	P-Value
Regression	5	12717.292	2543.458	281.590	<.0001
Residual	11568	104487.713	9.032		
Total	11573	117205.005			

Regression Coefficients**Tdiff vs. 5 Independents****Inclusion criteria: Criteria 2 from Lcn-C1.svd**

	Coefficient	Std. Error	Std. Coeff.	t-Value	P-Value
Intercept	2.822	.068	2.822	41.239	<.0001
Lcn2-3	.816	.097	.096	8.428	<.0001
Lcn3-4	-.021	.097	-.002	-.214	.8305
Lcn4-5	1.854	.097	.217	19.154	<.0001
Lcn5-6	-1.558	.097	-.182	-16.099	<.0001
Lcn6-7	.820	.097	.096	8.477	<.0001

Figure I-2 regression results for test of linearity for incremental temperature differences for Collector One in the temperature range 50°F to 70°F

Regression Summary**Tdiff vs. 5 Independents****Inclusion criteria: Criteria 3 from Lcn-C1.svd**

Count	6120
Num. Missing	0
R	.517
R Squared	.267
Adjusted R Squared	.266
RMS Residual	2.856

ANOVA Table**Tdiff vs. 5 Independents****Inclusion criteria: Criteria 3 from Lcn-C1.svd**

	DF	Sum of Squares	Mean Square	F-Value	P-Value
Regression	5	18162.196	3632.439	445.243	<.0001
Residual	6114	49880.067	8.158		
Total	6119	68042.262			

Regression Coefficients**Tdiff vs. 5 Independents****Inclusion criteria: Criteria 3 from Lcn-C1.svd**

	Coefficient	Std. Error	Std. Coeff.	t-Value	P-Value
Intercept	4.997	.089	4.997	55.875	<.0001
Lcn2-3	1.290	.126	.144	10.197	<.0001
Lcn3-4	.153	.126	.017	1.214	.2250
Lcn4-5	2.629	.126	.294	20.784	<.0001
Lcn5-6	-3.050	.126	-.341	-24.112	<.0001
Lcn6-7	.580	.126	.065	4.583	<.0001

Figure I-3 regression results for test of linearity for incremental temperature differences for Collector One in the temperature range 70°F to 90°F

Regression Summary**Tdiff vs. 5 Independents****Inclusion criteria: Criteria 1 from Lcn-C2.svd**

Count	3006
Num. Missing	0
R	.540
R Squared	.292
Adjusted R Squared	.291
RMS Residual	6.774

ANOVA Table**Tdiff vs. 5 Independents****Inclusion criteria: Criteria 1 from Lcn-C2.svd**

	DF	Sum of Squares	Mean Square	F-Value	P-Value
Regression	5	56756.974	11351.395	247.352	<.0001
Residual	3000	137675.245	45.892		
Total	3005	194432.218			

Regression Coefficients**Tdiff vs. 5 Independents****Inclusion criteria: Criteria 1 from Lcn-C2.svd**

	Coefficient	Std. Error	Std. Coeff.	t-Value	P-Value
Intercept	1.022	.303	1.022	3.376	.0007
Lcn2-3	1.115	.428	.052	2.606	.0092
Lcn3-4	.330	.428	.015	.771	.4409
Lcn4-5	5.564	.428	.258	12.999	<.0001
Lcn5-6	1.202	.428	.056	2.809	.0050
Lcn6-7	12.207	.428	.566	28.521	<.0001

Figure I-4 regression results for test of linearity for incremental temperature differences for Collector Two in the temperature range 30°F to 50°F

Regression Summary**Tdiff vs. 5 Independents****Inclusion criteria: Criteria 2 from Lcn-C2.svd**

Count	12456
Num. Missing	0
R	.661
R Squared	.437
Adjusted R Squared	.437
RMS Residual	6.511

ANOVA Table**Tdiff vs. 5 Independents****Inclusion criteria: Criteria 2 from Lcn-C2.svd**

	DF	Sum of Squares	Mean Square	F-Value	P-Value
Regression	5	409655.334	81931.067	1932.637	<.0001
Residual	12450	527797.999	42.393		
Total	12455	937453.334			

Regression Coefficients**Tdiff vs. 5 Independents****Inclusion criteria: Criteria 2 from Lcn-C2.svd**

	Coefficient	Std. Error	Std. Coeff.	t-Value	P-Value
Intercept	2.949	.143	2.949	20.640	<.0001
Lcn2-3	.955	.202	.041	4.725	<.0001
Lcn3-4	-.075	.202	-.003	-.370	.7113
Lcn4-5	8.009	.202	.344	39.631	<.0001
Lcn5-6	.833	.202	.036	4.120	<.0001
Lcn6-7	15.382	.202	.661	76.114	<.0001

Figure I-5 regression results for test of linearity for incremental temperature differences for Collector Two in the temperature range 50°F to 70°F

Regression Summary**Tdiff vs. 5 Independents****Inclusion criteria: Criteria 3 from Lcn-C2.svd**

Count	4470
Num. Missing	0
R	.822
R Squared	.675
Adjusted R Squared	.675
RMS Residual	5.274

ANOVA Table**Tdiff vs. 5 Independents****Inclusion criteria: Criteria 3 from Lcn-C2.svd**

	DF	Sum of Squares	Mean Square	F-Value	P-Value
Regression	5	257848.658	51569.732	1854.246	<.0001
Residual	4464	124151.431	27.812		
Total	4469	382000.088			

Regression Coefficients**Tdiff vs. 5 Independents****Inclusion criteria: Criteria 3 from Lcn-C2.svd**

	Coefficient	Std. Error	Std. Coeff.	t-Value	P-Value
Intercept	5.260	.193	5.260	27.226	<.0001
Lcn2-3	.914	.273	.037	3.345	.0008
Lcn3-4	-.241	.273	-.010	-.882	.3778
Lcn4-5	10.554	.273	.425	38.624	<.0001
Lcn5-6	-.342	.273	-.014	-1.251	.2109
Lcn6-7	19.752	.273	.796	72.288	<.0001

Figure I-6 regression results for test of linearity for incremental temperature differences for Collector Two in the temperature range 70°F to 90°F

Regression Summary**Tdiff vs. 5 Independents****Inclusion criteria: Criteria 1 from Lcn-C3.svd**

Count	2976
Num. Missing	0
R	.528
R Squared	.279
Adjusted R Squared	.277
RMS Residual	6.791

ANOVA Table**Tdiff vs. 5 Independents****Inclusion criteria: Criteria 1 from Lcn-C3.svd**

	DF	Sum of Squares	Mean Square	F-Value	P-Value
Regression	5	52914.018	10582.804	229.459	<.0001
Residual	2970	136978.280	46.121		
Total	2975	189892.298			

Regression Coefficients**Tdiff vs. 5 Independents****Inclusion criteria: Criteria 1 from Lcn-C3.svd**

	Coefficient	Std. Error	Std. Coeff.	t-Value	P-Value
Intercept	1.496	.305	1.496	4.906	<.0001
Lcn2-3	2.045	.431	.095	4.743	<.0001
Lcn3-4	2.967	.431	.138	6.881	<.0001
Lcn4-5	-1.546	.431	-.072	-3.585	.0003
Lcn5-6	1.596	.431	.074	3.702	.0002
Lcn6-7	11.627	.431	.542	26.961	<.0001

Figure I-7 regression results for test of linearity for incremental temperature differences for Collector Three in the temperature range 30°F to 50°F

Regression Summary**Tdiff vs. 5 Independents****Inclusion criteria: Criteria 2 from Lcn-C3.svd**

Count	12558
Num. Missing	0
R	.578
R Squared	.334
Adjusted R Squared	.333
RMS Residual	7.038

ANOVA Table**Tdiff vs. 5 Independents****Inclusion criteria: Criteria 2 from Lcn-C3.svd**

	DF	Sum of Squares	Mean Square	F-Value	P-Value
Regression	5	311471.911	62294.382	1257.489	<.0001
Residual	12552	621809.764	49.539		
Total	12557	933281.675			

Regression Coefficients**Tdiff vs. 5 Independents****Inclusion criteria: Criteria 2 from Lcn-C3.svd**

	Coefficient	Std. Error	Std. Coeff.	t-Value	P-Value
Intercept	3.819	.154	3.819	24.820	<.0001
Lcn2-3	1.549	.218	.067	7.118	<.0001
Lcn3-4	2.712	.218	.117	12.467	<.0001
Lcn4-5	.884	.218	.038	4.064	<.0001
Lcn5-6	.993	.218	.043	4.566	<.0001
Lcn6-7	14.411	.218	.623	66.235	<.0001

Figure I-8 regression results for test of linearity for incremental temperature differences for Collector Three in the temperature range 50°F to 70°F

Regression Summary**Tdiff vs. 5 Independents****Inclusion criteria: Criteria 3 from Lcn-C3.svd**

Count	4422
Num. Missing	0
R	.700
R Squared	.490
Adjusted R Squared	.489
RMS Residual	6.322

ANOVA Table**Tdiff vs. 5 Independents****Inclusion criteria: Criteria 3 from Lcn-C3.svd**

	DF	Sum of Squares	Mean Square	F-Value	P-Value
Regression	5	169369.331	33873.866	847.563	<.0001
Residual	4416	176490.641	39.966		
Total	4421	345859.972			

Regression Coefficients**Tdiff vs. 5 Independents****Inclusion criteria: Criteria 3 from Lcn-C3.svd**

	Coefficient	Std. Error	Std. Coeff.	t-Value	P-Value
Intercept	6.225	.233	6.225	26.732	<.0001
Lcn2-3	1.475	.329	.062	4.478	<.0001
Lcn3-4	3.149	.329	.133	9.563	<.0001
Lcn4-5	2.654	.329	.112	8.059	<.0001
Lcn5-6	.252	.329	.011	.764	.4450
Lcn6-7	17.826	.329	.751	54.128	<.0001

Figure I-9 regression results for test of linearity for incremental temperature differences for Collector Three in the temperature range 70°F to 90°F