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Project: LP2, F19, Wk# 9, Easter Bunny Basket (see photo)

Purpose: Determine amount of solid ink density variation within ~>400 consecutive printed press sheets.

Press: Ryobi 2800 CDXL, old 1995?. This is a 1/c duplicator. (see photo)

Speed: Constant, 1,000 previous. About 5K sph.

Inking: Constant, 1,000 previous. No key or sweep adjustments.

Dampening: Constant, 1,000 previous. No sweep adjustments.

Dampener: Reciprocating Ductor, flooded nip, integrated (is duct spitting water droplets? Saw no water on rollers)

Interruptions: None, no stop & restarts, continuous running.

Paper: International Paper, Williamsburg Offset, Smooth, 60lb (0.0042") Uncoated (plain, offset)

Paper: Probably 3-4 roll sheeted? Rough surface texture

Ink: Black, Braden-Stuphin

Plate: Aluminum metal, analog film based.

Image Coverage: Light

Instrument: X-Rite, eXact, Advanced, 2.0 mm aperture, calibrated

Data Capture: X-Rite Data Catcher

Backer: Self

Condition: Dry, M0 (tungsten, A), Status T, Absolute (+p).

Patch: 100% solid, live image (uniform, large)

Max =	1.353	0.121	1.325	1.261	1.312
Min =	1.130	-0.133	1.147	1.209	1.113
Rng =	0.223	0.253	0.178	0.052	0.199
R/6 =	0.037	0.042	0.030	0.009	0.033
StDev =	0.038	0.044	0.030	0.015	0.035
Avg =	1.235	0.000	1.235	1.235	1.209
(-) <0 =		52%			
(+) >0 =		48%			

Linear Regression (Least Squares)
0.00012 = Slope (m)
1.20899 = Y-Intercept (b)
0.15911 = R² Coefficient of Determination
1.209 = Y if X = 1
1.260 = Y if X = 424
0.051 0.012 = per 100 shts.

Y = mX + b	Remove
Linear	Trend
Regression	Calculated
1.2090	1.1432
1.2091	1.2052
1.2092	1.2235
1.2094	1.2318
1.2095	1.1693
1.2096	1.1613
1.2097	1.2068
1.2098	1.2348
1.2100	1.2295
1.2101	1.2034
1.2102	1.2509
1.2103	1.1755
1.2105	1.2460
1.2106	1.2541
1.2107	1.2133
1.2108	1.2005
1.2109	1.2034
1.2111	1.1945
1.2112	1.1885
1.2113	1.1279
1.2114	1.1620
1.2116	1.1545
1.2117	1.1717
1.2118	1.1477
1.2119	1.2071
1.2121	1.1703
1.2122	1.1693
1.2123	1.1552
1.2124	1.2342
1.2125	1.2036
1.2127	1.1695
1.2128	1.1906
1.2129	1.2815
1.2130	1.1926
1.2132	1.2640
1.2133	1.2149
1.2134	1.2275
1.2135	1.2169
1.2136	1.2233
1.2138	1.2581
1.2139	1.2320
1.2140	1.2414
1.2141	1.2303
1.2143	1.1574
1.2144	1.2150
1.2145	1.1821
1.2146	1.2022
1.2147	1.2249
1.2149	1.2101
1.2150	1.2441
1.2151	1.2612
1.2152	1.2134
1.2154	1.2122
1.2155	1.2411
1.2156	1.1922
1.2157	1.2954
1.2159	1.2253
1.2160	1.2404
1.2161	1.2386
1.2162	1.2280
1.2163	1.2429
1.2165	1.2161
1.2166	1.1922
1.2167	1.2661
1.2168	1.2462
1.2170	1.2327
1.2171	1.2283
1.2172	1.2732

Histogram		425	100%	425		100%
Bins	Freq. Count		%	Freq. Count		%
1.12	0	0.0%	1	0.2%		
1.13	0	0.0%	5	1.2%		
1.14	1	0.2%	3	0.7%		
1.15	3	0.7%	9	2.1%		
1.16	4	0.9%	15	3.5%		
1.17	10	2.4%	21	4.9%		
1.18	11	2.6%	33	7.8%		
1.19	19	4.5%	33	7.8%		
1.20	25	5.9%	51	12.0%		
1.21	36	8.5%	48	11.3%		
1.22	39	9.2%	45	10.6%		
1.23	37	8.7%	41	9.6%		
1.24	52	12.2%	45	10.6%		
1.25	53	12.5%	26	6.1%		
1.26	40	9.4%	20	4.7%		
1.27	24	5.6%	11	2.6%		
1.28	19	4.5%	7	1.6%		
1.29	26	6.1%	3	0.7%		
1.30	6	1.4%	5	1.2%		
1.31	7	1.6%	2	0.5%		
1.32	4	0.9%	1	0.2%		
1.33	1	0.2%	0	0.0%		
1.34	2	0.5%	0	0.0%		
1.35	4	0.9%	0	0.0%		
1.36	2	0.5%	0	0.0%		

Sample	Black (M0)	Density	n=2	n=2
			Moving Range	Moving Average
0	1.1432		0	1.23
1	1.2053		0.0621	1.1743
2	1.2237		0.0184	1.2145
3	1.2322		0.0085	1.2280
4	1.1698		-0.0624	1.2010
5	1.1619		-0.0079	1.1659
6	1.2075		0.0456	1.1847
7	1.2356		0.0281	1.2216
8	1.2305		-0.0051	1.2331
9	1.2045		-0.0260	1.2175
10	1.2521		0.0476	1.2283
11	1.1768		-0.0753	1.2145
12	1.2474		0.0706	1.2121
13	1.2557		0.0083	1.2516
14	1.2150		-0.0407	1.2354
15	1.2023		-0.0127	1.2087
16	1.2053		0.0030	1.2038
17	1.1965		-0.0088	1.2009
18	1.1907		-0.0058	1.1936
19	1.1302		-0.0605	1.1605
20	1.1644		0.0342	1.1473
21	1.1570		-0.0074	1.1607
22	1.1743		0.0173	1.1657
23	1.1505		-0.0238	1.1624
24	1.2100		0.0595	1.1803
25	1.1733		-0.0367	1.1917
26	1.1724		-0.0009	1.1729
27	1.1585		-0.0139	1.1655
28	1.2376		0.0791	1.1981
29	1.2071		-0.0305	1.2224
30	1.1731		-0.0340	1.1901
31	1.1943		0.0212	1.1837
32	1.2854		0.0911	1.2399
33	1.1966		-0.0888	1.2410
34	1.2681		0.0715	1.2324
35	1.2191		-0.0490	1.2436
36	1.2318		0.0127	1.2255
37	1.2214		-0.0104	1.2266
38	1.2279		0.0065	1.2247
39	1.2628		0.0349	1.2454
40	1.2368		-0.0260	1.2498
41	1.2463		0.0095	1.2416
42	1.2354		-0.0109	1.2409
43	1.1626		-0.0728	1.1990
44	1.2203		0.0577	1.1915
45	1.1875		-0.0328	1.2039
46	1.2077		0.0202	1.1976
47	1.2306		0.0229	1.2192
48	1.2159		-0.0147	1.2233
49	1.2500		0.0341	1.2330
50	1.2672		0.0172	1.2586
51	1.2195		-0.0477	1.2434
52	1.2185		-0.0010	1.2190
53	1.2475		0.0290	1.2330
54	1.1987		-0.0488	1.2231
55	1.3020		0.1033	1.2504
56	1.2320		-0.0700	1.2670
57	1.2473		0.0153	1.2397
58	1.2456		-0.0017	1.2465
59	1.2351		-0.0105	1.2404
60	1.2501		0.0150	1.2426
61	1.2234		-0.0267	1.2368
62	1.1997		-0.0237	1.2116
63	1.2737		0.0740	1.2367
64	1.2539		-0.0198	1.2638
65	1.2405		-0.0134	1.2472
66	1.2362		-0.0043	1.2384
67	1.2813		0.0451	1.2588

Sample	Density	Moving Range	Moving Average	Regression	Calculated	Bins	Freq. Count	%	Freq. Count	%
68	1.2685	-0.0128	1.2749	1.2173	1.2603					
69	1.1802	-0.0883	1.2244	1.2174	1.1719					
70	1.2474	0.0672	1.2138	1.2176	1.2390					
71	1.2313	-0.0161	1.2394	1.2177	1.2227					
72	1.2028	-0.0285	1.2171	1.2178	1.1941					
73	1.2250	0.0222	1.2139	1.2179	1.2162					
74	1.2435	0.0185	1.2343	1.2181	1.2346					
75	1.1803	-0.0632	1.2119	1.2182	1.1713					
76	1.1668	-0.0135	1.1736	1.2183	1.1576					
77	1.2628	0.0960	1.2148	1.2184	1.2535					
78	1.2214	-0.0414	1.2421	1.2185	1.2120					
79	1.2239	0.0025	1.2227	1.2187	1.2144					
80	1.2128	-0.0111	1.2184	1.2188	1.2032					
81	1.2613	0.0485	1.2371	1.2189	1.2515					
82	1.2537	-0.0076	1.2575	1.2190	1.2438					
83	1.2083	-0.0454	1.2310	1.2192	1.1983					
84	1.1977	-0.0106	1.2030	1.2193	1.1876					
85	1.1917	-0.0060	1.1947	1.2194	1.1815					
86	1.1997	0.0080	1.1957	1.2195	1.1893					
87	1.2271	0.0274	1.2134	1.2197	1.2166					
88	1.2406	0.0135	1.2339	1.2198	1.2300					
89	1.2451	0.0045	1.2429	1.2199	1.2344					
90	1.2842	0.0391	1.2647	1.2200	1.2734					
91	1.2495	-0.0347	1.2669	1.2201	1.2385					
92	1.2457	-0.0038	1.2476	1.2203	1.2346					
93	1.1852	-0.0605	1.2155	1.2204	1.1740					
94	1.2161	0.0309	1.2007	1.2205	1.2048					
95	1.2216	0.0055	1.2189	1.2206	1.2102					
96	1.2373	0.0157	1.2295	1.2208	1.2257					
97	1.2022	-0.0351	1.2198	1.2209	1.1905					
98	1.1879	-0.0143	1.1951	1.2210	1.1761					
99	1.1770	-0.0109	1.1825	1.2211	1.1651					
100	1.1692	-0.0078	1.1731	1.2212	1.1572					
101	1.2277	0.0585	1.1985	1.2214	1.2155					
102	1.1850	-0.0427	1.2064	1.2215	1.1727					
103	1.2531	0.0681	1.2191	1.2216	1.2407					
104	1.2422	-0.0109	1.2477	1.2217	1.2297					
105	1.2016	-0.0406	1.2219	1.2219	1.1890					
106	1.2443	0.0427	1.2230	1.2220	1.2315					
107	1.2357	-0.0086	1.2400	1.2221	1.2228					
108	1.2185	-0.0172	1.2271	1.2222	1.2055					
109	1.2485	0.0300	1.2335	1.2223	1.2354					
110	1.2198	-0.0287	1.2342	1.2225	1.2066					
111	1.2223	0.0025	1.2211	1.2226	1.2089					
112	1.2128	-0.0095	1.2176	1.2227	1.1993					
113	1.2730	0.0602	1.2429	1.2228	1.2594					
114	1.2559	-0.0171	1.2645	1.2230	1.2422					
115	1.1983	-0.0576	1.2271	1.2231	1.1844					
116	1.2365	0.0382	1.2174	1.2232	1.2225					
117	1.2832	0.0467	1.2599	1.2233	1.2691					
118	1.1995	-0.0837	1.2414	1.2235	1.1853					
119	1.2652	0.0657	1.2324	1.2236	1.2509					
120	1.2531	-0.0121	1.2592	1.2237	1.2386					
121	1.2466	-0.0065	1.2499	1.2238	1.2320					
122	1.2191	-0.0275	1.2329	1.2239	1.2044					
123	1.2428	0.0237	1.2310	1.2241	1.2280					
124	1.2315	-0.0113	1.2372	1.2242	1.2166					
125	1.1872	-0.0443	1.2094	1.2243	1.1721					
126	1.1730	-0.0142	1.1801	1.2244	1.1578					
127	1.1485	-0.0245	1.1608	1.2246	1.1332					
128	1.2182	0.0697	1.1834	1.2247	1.2028					
129	1.1799	-0.0383	1.1991	1.2248	1.1644					
130	1.1907	0.0108	1.1853	1.2249	1.1750					
131	1.1936	0.0029	1.1922	1.2250	1.1778					
132	1.2084	0.0148	1.2010	1.2252	1.1925					
133	1.1874	-0.0210	1.1979	1.2253	1.1714					
134	1.2104	0.0230	1.1989	1.2254	1.1943					
135	1.2226	0.0122	1.2165	1.2255	1.2063					
136	1.2452	0.0226	1.2339	1.2257	1.2288					
137	1.2161	-0.0291	1.2307	1.2258	1.1996					
138	1.2482	0.0321	1.2322	1.2259	1.2316					
139	1.1887	-0.0595	1.2185	1.2260	1.1720					
140	1.2333	0.0446	1.2110	1.2261	1.2164					
141	1.2604	0.0271	1.2469	1.2263	1.2434					
142	1.2442	-0.0162	1.2523	1.2264	1.2271					
143	1.2348	-0.0094	1.2395	1.2265	1.2176					
144	1.2573	0.0225	1.2461	1.2266	1.2400					
145	1.2171	-0.0402	1.2372	1.2268	1.1996					
146	1.2167	-0.0004	1.2169	1.2269	1.1991					

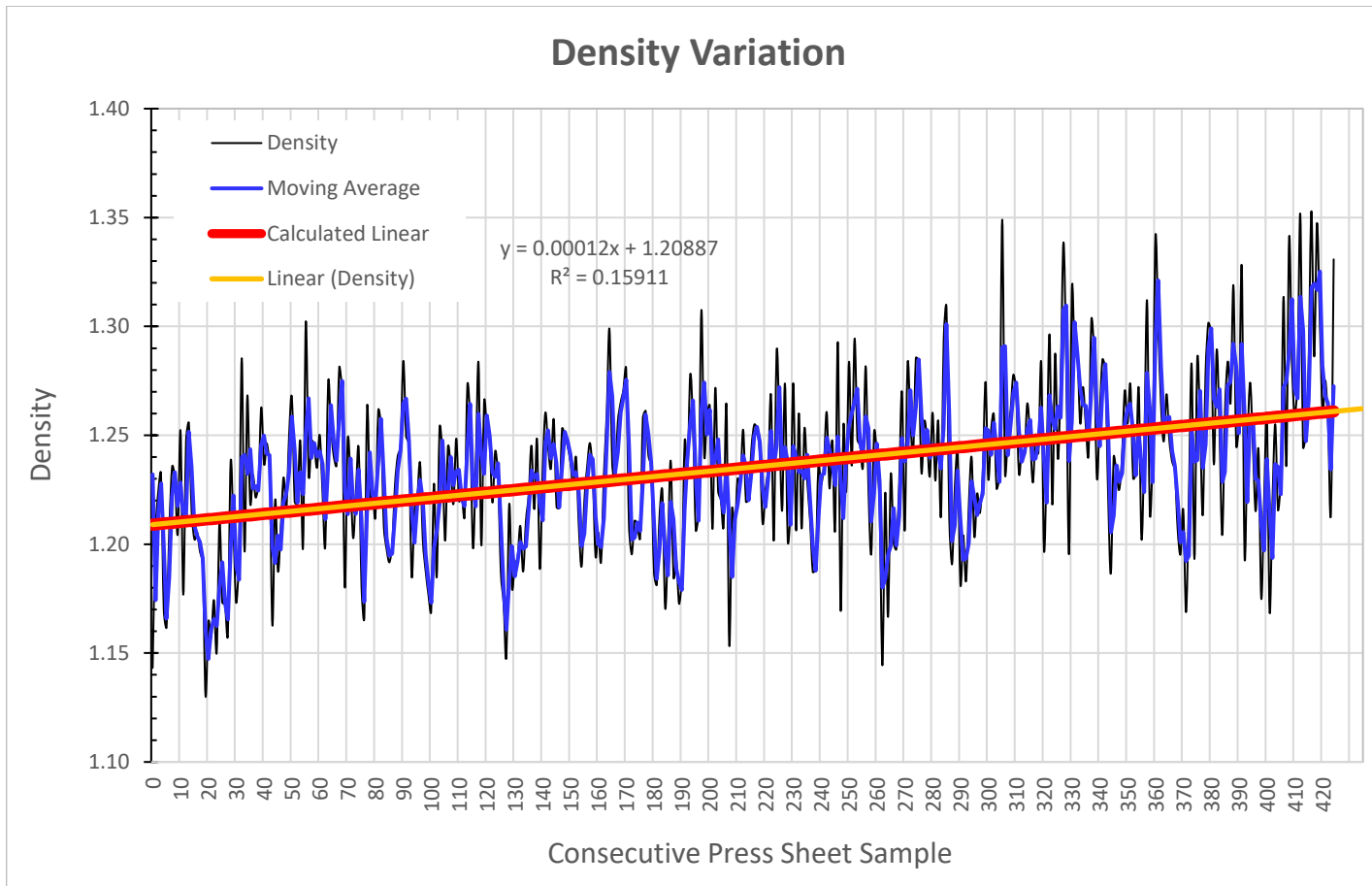
Sample	Density	Moving Range	Moving Average	Regression	Calculated	Bins	Freq. Count	%	Freq. Count	%
147	1.2530	0.0363	1.2349	1.2270	1.2353					
148	1.2501	-0.0029	1.2516	1.2271	1.2323					
149	1.2448	-0.0053	1.2475	1.2273	1.2269					
150	1.2377	-0.0071	1.2413	1.2274	1.2196					
151	1.2260	-0.0117	1.2319	1.2275	1.2078					
152	1.2399	0.0139	1.2330	1.2276	1.2216					
153	1.2083	-0.0316	1.2241	1.2277	1.1899					
154	1.1898	-0.0185	1.1991	1.2279	1.1713					
155	1.2199	0.0301	1.2049	1.2280	1.2012					
156	1.2357	0.0158	1.2278	1.2281	1.2169					
157	1.2464	0.0107	1.2411	1.2282	1.2275					
158	1.2316	-0.0148	1.2390	1.2284	1.2126					
159	1.1945	-0.0371	1.2131	1.2285	1.1753					
160	1.2054	0.0109	1.2000	1.2286	1.1861					
161	1.1920	-0.0134	1.1987	1.2287	1.1726					
162	1.2320	0.0400	1.2120	1.2288	1.2125					
163	1.2595	0.0275	1.2458	1.2290	1.2399					
164	1.2988	0.0393	1.2792	1.2291	1.2790					
165	1.2368	-0.0620	1.2678	1.2292	1.2169					
166	1.2288	-0.0080	1.2328	1.2293	1.2088					
167	1.2559	0.0271	1.2424	1.2295	1.2358					
168	1.2649	0.0090	1.2604	1.2296	1.2447					
169	1.2708	0.0059	1.2679	1.2297	1.2504					
170	1.2804	0.0096	1.2756	1.2298	1.2599					
171	1.2089	-0.0715	1.2447	1.2299	1.1883					
172	1.1953	-0.0136	1.2021	1.2301	1.1746					
173	1.2106	0.0153	1.2030	1.2302	1.1898					
174	1.2094	-0.0012	1.2100	1.2303	1.1884					
175	1.2029	-0.0065	1.2062	1.2304	1.1818					
176	1.2579	0.0550	1.2304	1.2306	1.2367					
177	1.2612	0.0033	1.2596	1.2307	1.2399					
178	1.2406	-0.0206	1.2509	1.2308	1.2192					
179	1.2349	-0.0057	1.2378	1.2309	1.2133					
180	1.1870	-0.0479	1.2110	1.2311	1.1653					
181	1.1814	-0.0056	1.1842	1.2312	1.1596					
182	1.2133	0.0319	1.1974	1.2313	1.1914					
183	1.2243	0.0110	1.2188	1.2314	1.2023					
184	1.1707	-0.0536	1.1975	1.2315	1.1485					
185	1.2007	0.0300	1.1857	1.2317	1.1784					
186	1.2382	0.0375	1.2195	1.2318	1.2158					
187	1.1849	-0.0533	1.2116	1.2319	1.1624					
188	1.1928	0.0079	1.1889	1.2320	1.1702					
189	1.1726	-0.0202	1.1827	1.2322	1.1498					
190	1.1853	0.0127	1.1790	1.2323	1.1624					
191	1.2471	0.0618	1.2162	1.2324	1.2241					
192	1.2328	-0.0143	1.2400	1.2325	1.2097					
193	1.2778	0.0450	1.2553	1.2326	1.2546					
194	1.2541	-0.0237	1.2660	1.2328	1.2307					
195	1.2063	-0.0478	1.2302	1.2329	1.1828					
196	1.2153	0.0090	1.2108	1.2330	1.1917					
197	1.3074	0.0921	1.2614	1.2331	1.2837					
198	1.2410	-0.0664	1.2742	1.2333	1.2172					
199	1.2598	0.0188	1.2504	1.2334	1.2358					
200	1.2636	0.0038	1.2617	1.2335	1.2395					
201	1.2070	-0.0566	1.2353	1.2336	1.1828					
202	1.2717	0.0647	1.2394	1.2337	1.2474					
203	1.2245	-0.0472	1.2481	1.2339	1.2000					
204	1.2205	-0.0040	1.2225	1.2340	1.1959					
205	1.2085	-0.0120	1.2145	1.2341	1.1838					
206	1.2637	0.0552	1.2361	1.2342	1.2389					
207	1.1538	-0.1099	1.2088	1.2344	1.1289					
208	1.2161	0.0623	1.1850	1.2345	1.1910					
209	1.2069	-0.0092	1.2115	1.2346	1.1817					
210	1.2301	0.0232	1.2185	1.2347	1.2048					
211	1.2289	-0.0012	1.2295	1.2349	1.2035					
212	1.2525	0.0236	1.2407	1.2350	1.2270					
213	1.2196	-0.0329	1.2361	1.2351	1.1939					
214	1.2209	0.0013	1.2203	1.2352	1.1951					
215	1.2445	0.0236	1.2327	1.2353	1.2186					
216	1.2549	0.0104	1.2497	1.2355	1.2289					
217	1.2528	-0.0021	1.2539	1.2356	1.2267					
218	1.2416	-0.0112	1.2472	1.2357	1.2153					
219	1.2095	-0.0321	1.2256	1.2358	1.1831					
220	1.2246	0.0151	1.2171	1.2360	1.1981					
221	1.2358	0.0112	1.2302	1.2361	1.2092					
222	1.2683	0.0325	1.2521	1.2362	1.2416					
223	1.2017	-0.0666	1.2350	1.2363	1.1748					
224	1.2884	0.0867	1.2451	1.2364	1.2614					
225	1.2559	-0.0325	1.2722	1.2366	1.2288					

Sample	Density	Moving Range	Moving Average	Regression	Calculated	Bins	Freq. Count	%	Freq. Count	%
226	1.2155	-0.0404	1.2357	1.2367	1.1883					
227	1.2738	0.0583	1.2447	1.2368	1.2465					
228	1.2017	-0.0721	1.2378	1.2369	1.1742					
229	1.2161	0.0144	1.2089	1.2371	1.1885					
230	1.2739	0.0578	1.2450	1.2372	1.2462					
231	1.2063	-0.0676	1.2401	1.2373	1.1785					
232	1.2601	0.0538	1.2332	1.2374	1.2322					
233	1.2072	-0.0529	1.2337	1.2375	1.1791					
234	1.2531	0.0459	1.2302	1.2377	1.2249					
235	1.2289	-0.0242	1.2410	1.2378	1.2006					
236	1.2113	-0.0176	1.2201	1.2379	1.1829					
237	1.1872	-0.0241	1.1993	1.2380	1.1587					
238	1.1884	0.0012	1.1878	1.2382	1.1597					
239	1.2358	0.0474	1.2121	1.2383	1.2070					
240	1.2274	-0.0084	1.2316	1.2384	1.1985					
241	1.2372	0.0098	1.2323	1.2385	1.2082					
242	1.2606	0.0234	1.2489	1.2387	1.2315					
243	1.2257	-0.0349	1.2432	1.2388	1.1964					
244	1.2475	0.0218	1.2366	1.2389	1.2181					
245	1.2065	-0.0410	1.2270	1.2390	1.1770					
246	1.2925	0.0860	1.2495	1.2391	1.2629					
247	1.1697	-0.1228	1.2311	1.2393	1.1399					
248	1.2541	0.0844	1.2119	1.2394	1.2242					
249	1.2243	-0.0298	1.2392	1.2395	1.1943					
250	1.2838	0.0595	1.2541	1.2396	1.2537					
251	1.2361	-0.0477	1.2600	1.2398	1.2059					
252	1.2944	0.0583	1.2653	1.2399	1.2640					
253	1.2483	-0.0461	1.2714	1.2400	1.2178					
254	1.2455	-0.0028	1.2469	1.2401	1.2149					
255	1.2356	-0.0099	1.2406	1.2402	1.2049					
256	1.2817	0.0461	1.2587	1.2404	1.2509					
257	1.2248	-0.0569	1.2533	1.2405	1.1938					
258	1.1958	-0.0290	1.2103	1.2406	1.1647					
259	1.2512	0.0554	1.2235	1.2407	1.2200					
260	1.2410	-0.0102	1.2461	1.2409	1.2097					
261	1.2159	-0.0251	1.2285	1.2410	1.1845					
262	1.1444	-0.0715	1.1802	1.2411	1.1128					
263	1.2235	0.0791	1.1840	1.2412	1.1918					
264	1.1666	-0.0569	1.1951	1.2413	1.1348					
265	1.2319	0.0653	1.1993	1.2415	1.2000					
266	1.2010	-0.0309	1.2165	1.2416	1.1690					
267	1.1978	-0.0032	1.1994	1.2417	1.1656					
268	1.2275	0.0297	1.2127	1.2418	1.1952					
269	1.2700	0.0425	1.2488	1.2420	1.2376					
270	1.2062	-0.0638	1.2381	1.2421	1.1737					
271	1.2824	0.0762	1.2443	1.2422	1.2498					
272	1.2590	-0.0234	1.2707	1.2423	1.2262					
273	1.2410	-0.0180	1.2500	1.2425	1.2081					
274	1.2855	0.0445	1.2633	1.2426	1.2525					
275	1.2841	-0.0014	1.2848	1.2427	1.2510					
276	1.2329	-0.0512	1.2585	1.2428	1.1997					
277	1.2563	0.0234	1.2446	1.2429	1.2229					
278	1.2485	-0.0078	1.2524	1.2431	1.2150					
279	1.2311	-0.0174	1.2398	1.2432	1.1975					
280	1.2604	0.0293	1.2458	1.2433	1.2267					
281	1.2292	-0.0312	1.2448	1.2434	1.1954					
282	1.2567	0.0275	1.2430	1.2436	1.2227					
283	1.2128	-0.0439	1.2348	1.2437	1.1787					
284	1.2938	0.0810	1.2533	1.2438	1.2596					
285	1.3084	0.0146	1.3011	1.2439	1.2741					
286	1.2121	-0.0963	1.2603	1.2440	1.1777					
287	1.1908	-0.0213	1.2015	1.2442	1.1562					
288	1.2262	0.0354	1.2085	1.2443	1.1915					
289	1.2413	0.0151	1.2338	1.2444	1.2065					
290	1.1816	-0.0597	1.2115	1.2445	1.1467					
291	1.2041	0.0225	1.1929	1.2447	1.1690					
292	1.1830	-0.0211	1.1936	1.2448	1.1478					
293	1.2177	0.0347	1.2004	1.2449	1.1824					
294	1.2400	0.0223	1.2289	1.2450	1.2046					
295	1.2034	-0.0366	1.2217	1.2451	1.1679					
296	1.2232	0.0198	1.2133	1.2453	1.1875					
297	1.2144	-0.0088	1.2188	1.2454	1.1786					
298	1.2321	0.0177	1.2233	1.2455	1.1962					
299	1.2745	0.0424	1.2533	1.2456	1.2385					
300	1.2299	-0.0446	1.2522	1.2458	1.1938					
301	1.2522	0.0223	1.2411	1.2459	1.2159					
302	1.2593	0.0071	1.2558	1.2460	1.2229					
303	1.2254	-0.0339	1.2424	1.2461	1.1889					
304	1.2317	0.0063	1.2286	1.2463	1.1951					

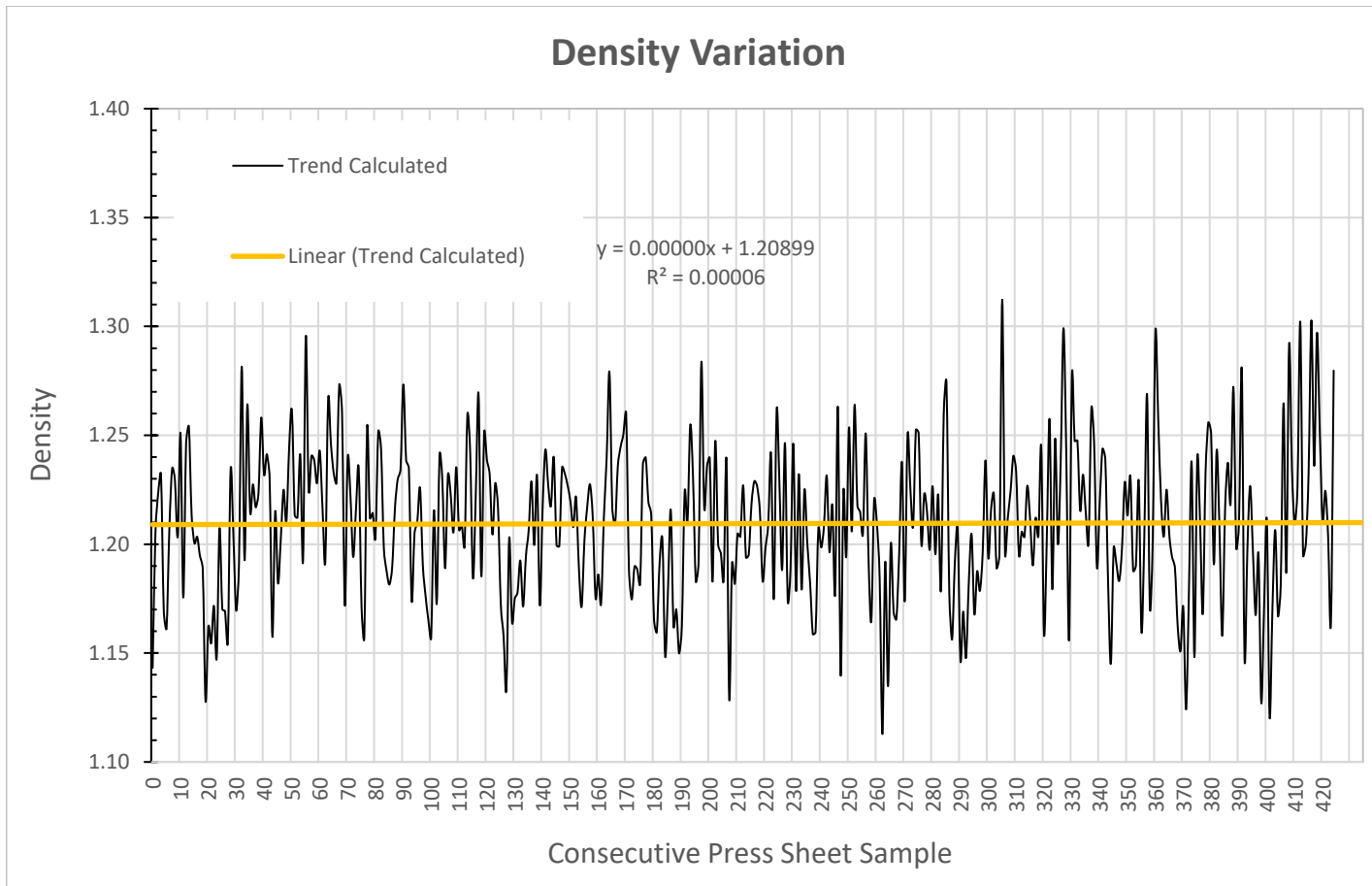
Sample	Density	Moving Range	Moving Average	Regression	Calculated	Bins	Freq. Count	%	Freq. Count	%
305	1.3490	0.1173	1.2904	1.2464	1.3123					
306	1.2329	-0.1161	1.2910	1.2465	1.1960					
307	1.2490	0.0161	1.2410	1.2466	1.2120					
308	1.2615	0.0125	1.2553	1.2467	1.2244					
309	1.2778	0.0163	1.2697	1.2469	1.2406					
310	1.2707	-0.0071	1.2743	1.2470	1.2334					
311	1.2326	-0.0381	1.2517	1.2471	1.1951					
312	1.2433	0.0107	1.2380	1.2472	1.2057					
313	1.2411	-0.0022	1.2422	1.2474	1.2034					
314	1.2646	0.0235	1.2529	1.2475	1.2268					
315	1.2494	-0.0152	1.2570	1.2476	1.2115					
316	1.2283	-0.0211	1.2389	1.2477	1.1902					
317	1.2503	0.0220	1.2393	1.2478	1.2121					
318	1.2422	-0.0081	1.2463	1.2480	1.2039					
319	1.2833	0.0411	1.2628	1.2481	1.2449					
320	1.1974	-0.0859	1.2404	1.2482	1.1589					
321	1.2408	0.0434	1.2191	1.2483	1.2021					
322	1.2961	0.0553	1.2685	1.2485	1.2573					
323	1.2182	-0.0779	1.2572	1.2486	1.1793					
324	1.2874	0.0692	1.2528	1.2487	1.2484					
325	1.2392	-0.0482	1.2633	1.2488	1.2001					
326	1.2770	0.0378	1.2581	1.2489	1.2377					
327	1.3386	0.0616	1.3078	1.2491	1.2992					
328	1.2805	-0.0581	1.3096	1.2492	1.2410					
329	1.1958	-0.0847	1.2382	1.2493	1.1562					
330	1.3164	0.1206	1.2561	1.2494	1.2767					
331	1.2873	-0.0291	1.3019	1.2496	1.2474					
332	1.2875	0.0002	1.2874	1.2497	1.2475					
333	1.2555	-0.0320	1.2715	1.2498	1.2154					
334	1.2722	0.0167	1.2639	1.2499	1.2320					
335	1.2549	-0.0173	1.2636	1.2501	1.2145					
336	1.2413	-0.0136	1.2481	1.2502	1.2008					
337	1.3028	0.0615	1.2721	1.2503	1.2622					
338	1.2869	-0.0159	1.2949	1.2504	1.2462					
339	1.2302	-0.0567	1.2586	1.2505	1.1894					
340	1.2597	0.0295	1.2450	1.2507	1.2187					
341	1.2849	0.0252	1.2723	1.2508	1.2438					
342	1.2803	-0.0046	1.2826	1.2509	1.2391					
343	1.2243	-0.0560	1.2523	1.2510	1.1830					
344	1.1866	-0.0377	1.2055	1.2512	1.1452					
345	1.2398	0.0532	1.2132	1.2513	1.1982					
346	1.2326	-0.0072	1.2362	1.2514	1.1909					
347	1.2250	-0.0076	1.2288	1.2515	1.1832					
348	1.2401	0.0151	1.2326	1.2516	1.1982					
349	1.2705	0.0304	1.2553	1.2518	1.2285					
350	1.2553	-0.0152	1.2629	1.2519	1.2131					
351	1.2734	0.0181	1.2644	1.2520	1.2311					
352	1.2303	-0.0431	1.2519	1.2521	1.1879					
353	1.2328	0.0025	1.2316	1.2523	1.1903					
354	1.2718	0.0390	1.2523	1.2524	1.2292					
355	1.2024	-0.0694	1.2371	1.2525	1.1596					
356	1.2455	0.0431	1.2240	1.2526	1.2026					
357	1.3117	0.0662	1.2786	1.2527	1.2687					
358	1.2141	-0.0976	1.2629	1.2529	1.1710					
359	1.2428	0.0287	1.2285	1.2530	1.1996					
360	1.3410	0.0982	1.2919	1.2531	1.2976					
361	1.3013	-0.0397	1.3212	1.2532	1.2578					
362	1.2643	-0.0370	1.2828	1.2534	1.2207					
363	1.2472	-0.0171	1.2558	1.2535	1.2035					
364	1.2689	0.0217	1.2581	1.2536	1.2251					
365	1.2479	-0.0210	1.2584	1.2537	1.2039					
366	1.2380	-0.0099	1.2430	1.2539	1.1939					
367	1.2334	-0.0046	1.2357	1.2540	1.1892					
368	1.2066	-0.0268	1.2200	1.2541	1.1623					
369	1.1953	-0.0113	1.2010	1.2542	1.1509					
370	1.2157	0.0204	1.2055	1.2543	1.1711					
371	1.1688	-0.0469	1.1923	1.2545	1.1241					
372	1.2206	0.0518	1.1947	1.2546	1.1758					
373	1.2827	0.0621	1.2517	1.2547	1.2378					
374	1.1932	-0.0895	1.2380	1.2548	1.1482					
375	1.2841	0.0909	1.2387	1.2550	1.2389					
376	1.2567	-0.0274	1.2704	1.2551	1.2114					
377	1.2135	-0.0432	1.2351	1.2552	1.1681					
378	1.2783	0.0648	1.2459	1.2553	1.2328					
379	1.3016	0.0233	1.2900	1.2554	1.2559					
380	1.2966	-0.0050	1.2991	1.2556	1.2508					
381	1.2366	-0.0600	1.2666	1.2557	1.1907					
382	1.2893	0.0527	1.2630	1.2558	1.2433					
383	1.2529	-0.0364	1.2711	1.2559	1.2068					

Sample	Density	Moving Range	Moving Average	Regression	Calculated	Bins	Freq. Count	%	Freq. Count	%
384	1.2042	-0.0487	1.2286	1.2561	1.1579					
385	1.2621	0.0579	1.2332	1.2562	1.2157					
386	1.2839	0.0218	1.2730	1.2563	1.2374					
387	1.2653	-0.0186	1.2746	1.2564	1.2187					
388	1.3188	0.0535	1.2921	1.2565	1.2721					
389	1.2455	-0.0733	1.2822	1.2567	1.1986					
390	1.2565	0.0110	1.2510	1.2568	1.2095					
391	1.3273	0.0708	1.2919	1.2569	1.2802					
392	1.1946	-0.1327	1.2610	1.2570	1.1474					
393	1.2442	0.0496	1.2194	1.2572	1.1969					
394	1.2742	0.0300	1.2592	1.2573	1.2267					
395	1.2446	-0.0296	1.2594	1.2574	1.1970					
396	1.2151	-0.0295	1.2299	1.2575	1.1674					
397	1.2433	0.0282	1.2292	1.2577	1.1955					
398	1.1751	-0.0682	1.2092	1.2578	1.1272					
399	1.2190	0.0439	1.1971	1.2579	1.1709					
400	1.2592	0.0402	1.2391	1.2580	1.2110					-0.00015
401	1.1690	-0.0902	1.2141	1.2581	1.1207					
402	1.2184	0.0494	1.1937	1.2583	1.1700					
403	1.2551	0.0367	1.2368	1.2584	1.2066					
404	1.2157	-0.0394	1.2354	1.2585	1.1670					
405	1.2302	0.0145	1.2230	1.2586	1.1814					
406	1.3136	0.0834	1.2719	1.2588	1.2647					
407	1.2360	-0.0776	1.2748	1.2589	1.1870					
408	1.3408	0.1048	1.2884	1.2590	1.2917					
409	1.2841	-0.0567	1.3125	1.2591	1.2348					
410	1.2585	-0.0256	1.2713	1.2592	1.2091					
411	1.2755	0.0170	1.2670	1.2594	1.2260					
412	1.3516	0.0761	1.3136	1.2595	1.3020					
413	1.2447	-0.1069	1.2982	1.2596	1.1950					
414	1.2498	0.0051	1.2473	1.2597	1.1999					
415	1.2832	0.0334	1.2665	1.2599	1.2332					
416	1.3529	0.0697	1.3181	1.2600	1.3028					
417	1.2862	-0.0667	1.3196	1.2601	1.2360					
418	1.3473	0.0611	1.3168	1.2602	1.2970					
419	1.3031	-0.0442	1.3252	1.2603	1.2526					
420	1.2611	-0.0420	1.2821	1.2605	1.2105					
421	1.2752	0.0141	1.2682	1.2606	1.2245					
422	1.2543	-0.0209	1.2648	1.2607	1.2035					
423	1.2144	-0.0399	1.2344	1.2608	1.1635					
424	1.3308	0.1164	1.2726	1.2610	1.2797					

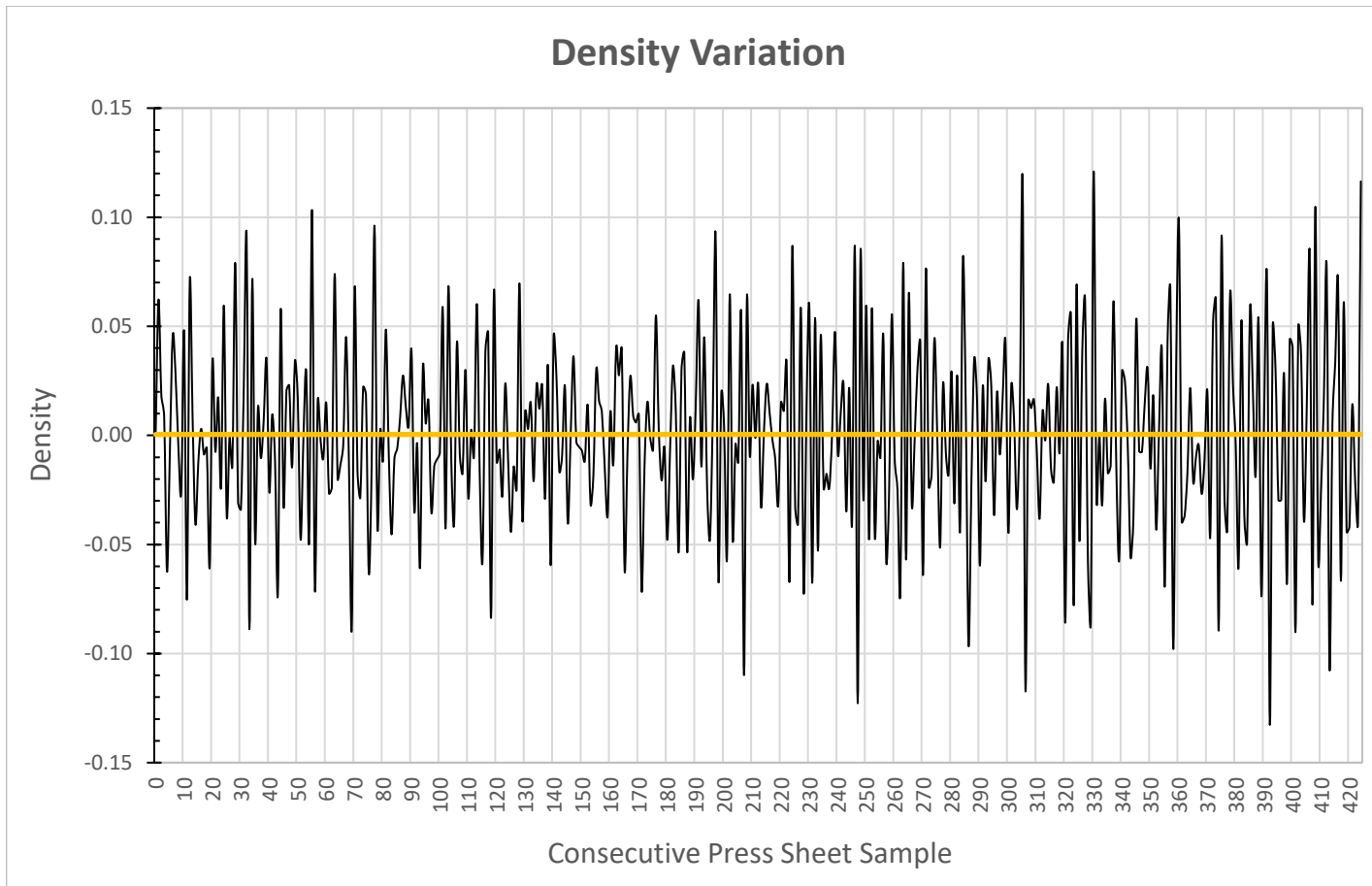
END



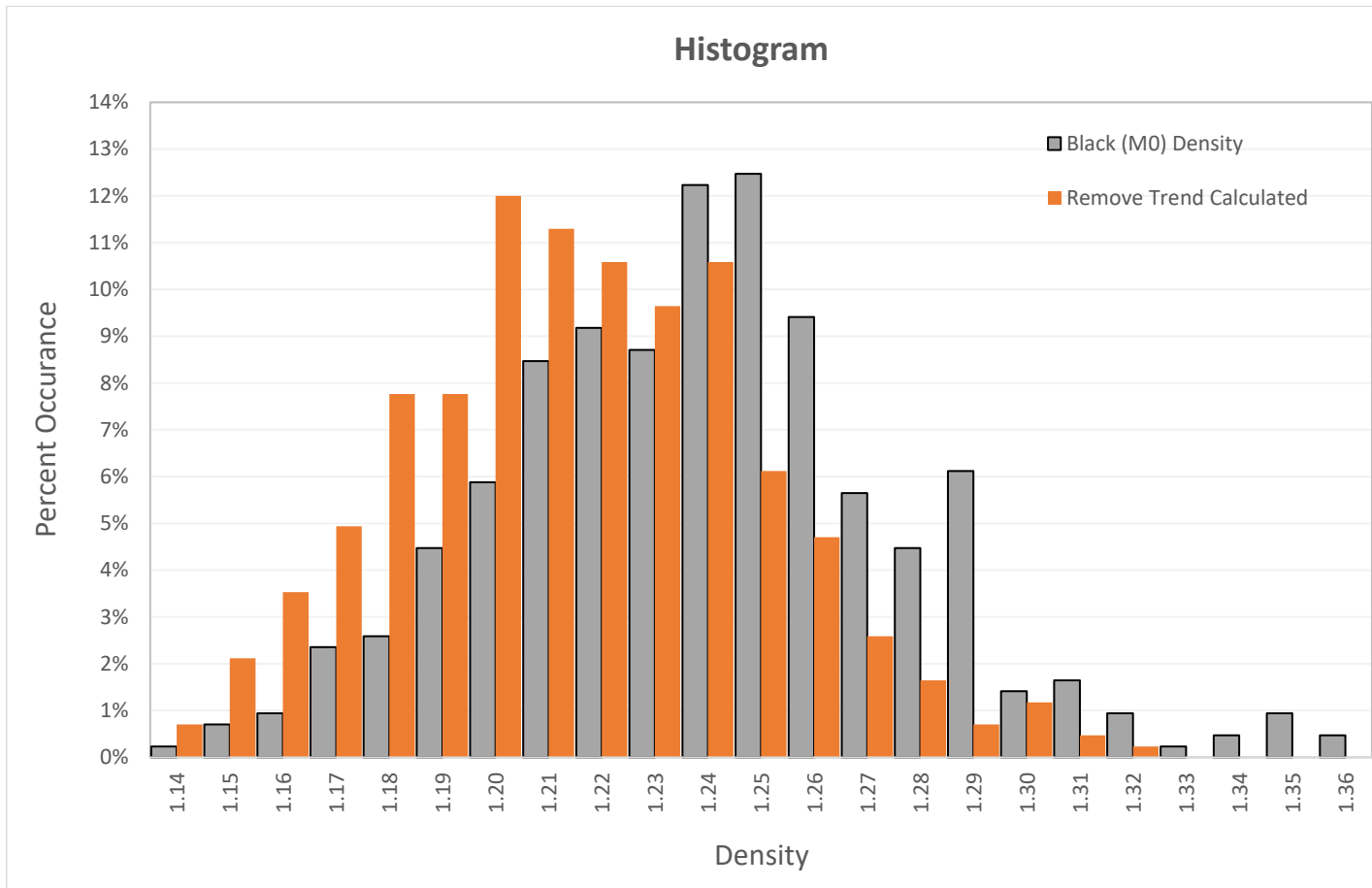
- 1 Data shows a slight upward trend pattern (getting darker).
- 2 Using chart filters (funnel icon), can turn display on or off for other series, real time.
- 3 Need to separate wanted signal from unwanted noise. Signal/Noise ratio.
- 4 Averages ($n > 1$) always have less variation than the individuals ($n = 1$).
- 5 Using format trendline, can change individual linear ($n = 1$) to moving average, with a period of $n > 1$.
- 6 R^2 is Coefficient of Determination (=RSQ), **NOT** the same as "r" or correlation coefficient (=Correl).
- 7 R^2 from chart trendline should agree with calculated =RSQ function.
- 8 $R^2 = -1$ or $+1$ is strong (perfect) correlation between 2 variables. $R^2 = 0$ is none!
- 9
- 10



- 1 Adjusted data to remove positive upward trend, to become flatline.
- 2 Must keep Y axis scale the same for comparative purposes.
- 3 After adjusting to remove trend, data should show less total variation, less max, less rng, less stdev.
- 4
- 5
- 6
- 7
- 8
- 9
- 10



- 1 Data is difference between previous, consecutive, adjacent pair or range (moving range, mR N=2).
- 2 Typical tolerance limit is +/-0.05. Is this realistic and practical for these results?
- 3 How can real or actual value be determined? Averaging reduces variation or "noise".
- 4 Does X-Rite eXact has an averaging option available for density? It does for color.
- 5 Is there any evidence of a repeating cycle? Maybe about every 20th sht?
- 6
- 7
- 8
- 9
- 10



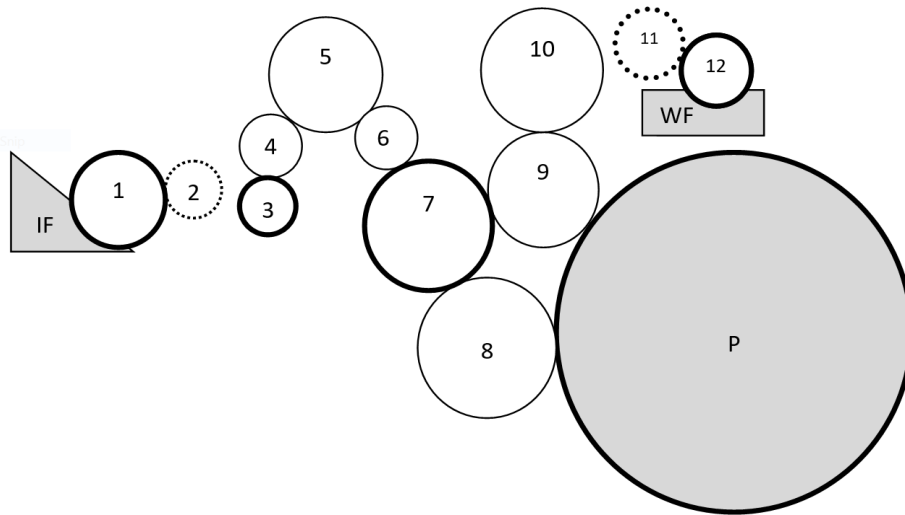
- 1 Histogram's class interval or width is 0.01 density unit.
- 2 Histogram visually displays type (shape, normal bell) and amount of variation (spread, mode)
- 3 Check to see if any chart filters (funnel icon) are being applied.
- 4
- 5
- 6 Empirical Rule: Standard Deviation +/-1s = 68% or 2/3rds, +/-2s = 95% or 19/20, +/-3s = 99.7% or 1/333
- 7 Entering formula for =frequency, select range first, enter formula, then Ctrl+Shift+Enter to fill in.
- 8 An array formula is inclosed inside a bracket {}.
- 9
- 10

Notes:

- 1 What are research questions? What do you want to find out or get an answer to a question (learn, knowledge)
- 2 Why is this important or what practical, real world value does this have?
- 3 You just don't know for sure unless you ask, or look. Assumptions!
- 4 Are test results normal, typical, expected performance behavior for these process conditions?
- 5 Is there something wrong or broken with the machine or is this just a limitation of design (get what you pay for! ~\$25K)
- 6 Does machine or process performance results meet or satisfy desired expectations or needs?
- 7 Source/Cause of Variation = 6-M's (Machine, Material, Measurement, Method, Operator, Environment)
- 8 Brainstorm a Cause & Effect fishbone diagram.
- 9 Need to repeat same test on gloss coated paper, which is smoother, more uniform.
- 10 Need to repeat same test on better Ryobi 3302 M&C, with true continuous dampener (no ducting).
- 11 Need to repeat similar test with timed stop & restart to see affects of upset ink & water balance.
- 12 See schematic diagram of ink train for Ryobi 2800, shows 2 ink form rollers.
- 13 Both ink & water ductor duct once per plate revolution, 1:1.
- 14 Maybe timing of oscillator vibrator to water ductor is about every 20 sheets?
- 15 This particular rubber offset blanket has a history of getting fine hair line cracks on surface from wash evaporation?
- 16 Forgot to check back tail end of blanket for any excessive water bead/droplets.
- 17 What is spatial uniformity of sample patch?
- 18 How does sample patch look under a loupe? Mottled? Pin-Holy? Emulsified?
- 19 Level of accuracy is dependent on level of precision.
- 20 Level of between sheet is dependent on level of within sheet.
- 21 Data Capture software can collect M0, M2, M3 simultaneously with a single measurement.
- 22 Unwanted M3 (polarized) data was deleted. Avg was 1.646 (+0.411) and Stdev was 0.065 (+1.71x)
- 23
- 24
- 25
- 26
- 27
- 28
- 29
- 30



Ink & Dampener Rollers (Ryobi 2800)



- 1 Rollers with dotted lines are ductors.
- 2 Rollers #5.7.10 are oscillator or vibrator.
- 3 Roller # 8 & 9 are forms.
- 4 ABDick 1960> Itek 1988> Presstek 204, Ryobi 1961