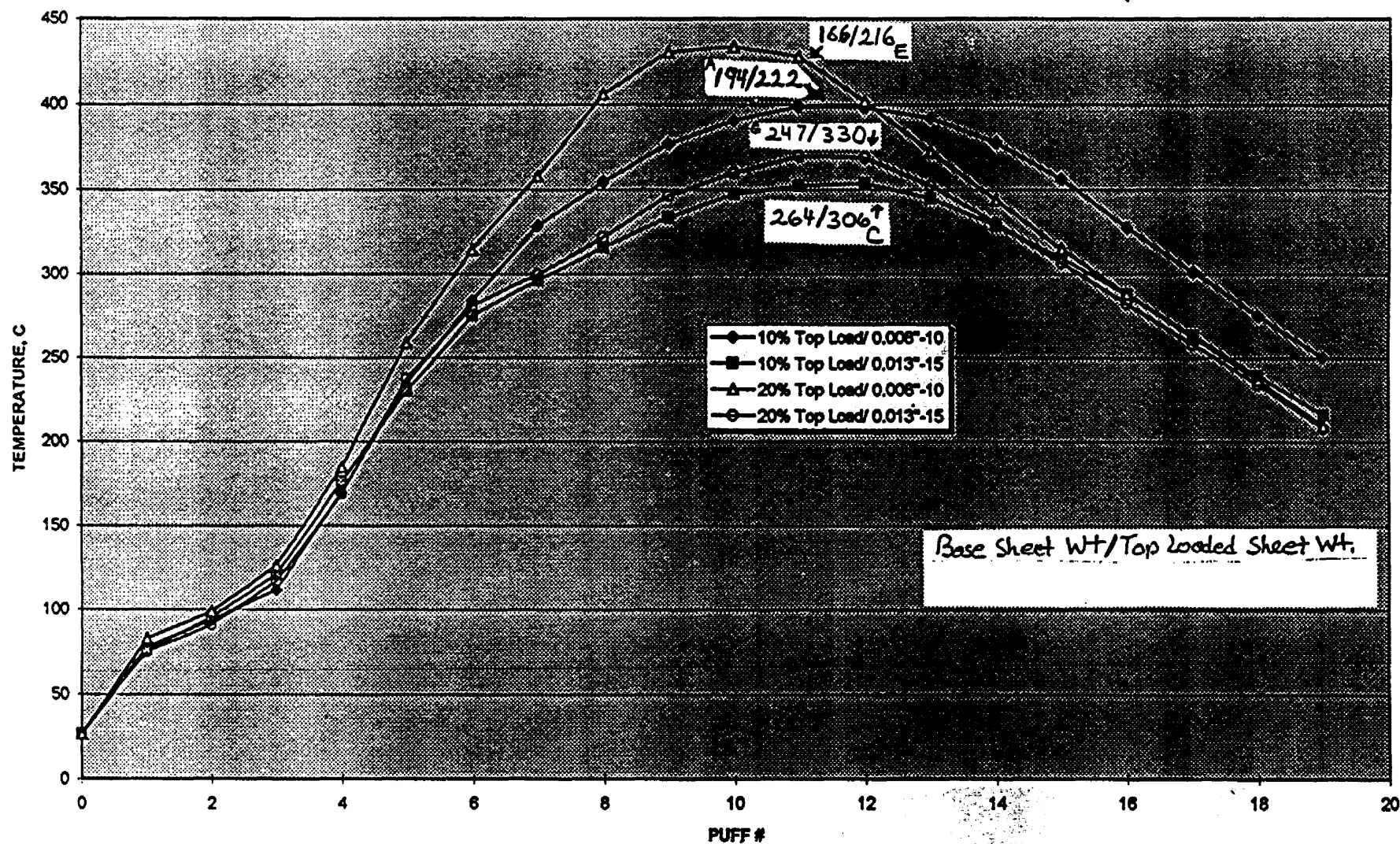


4-057: INTERNAL CIGARETTE 5MM INTO SUBSTRATE



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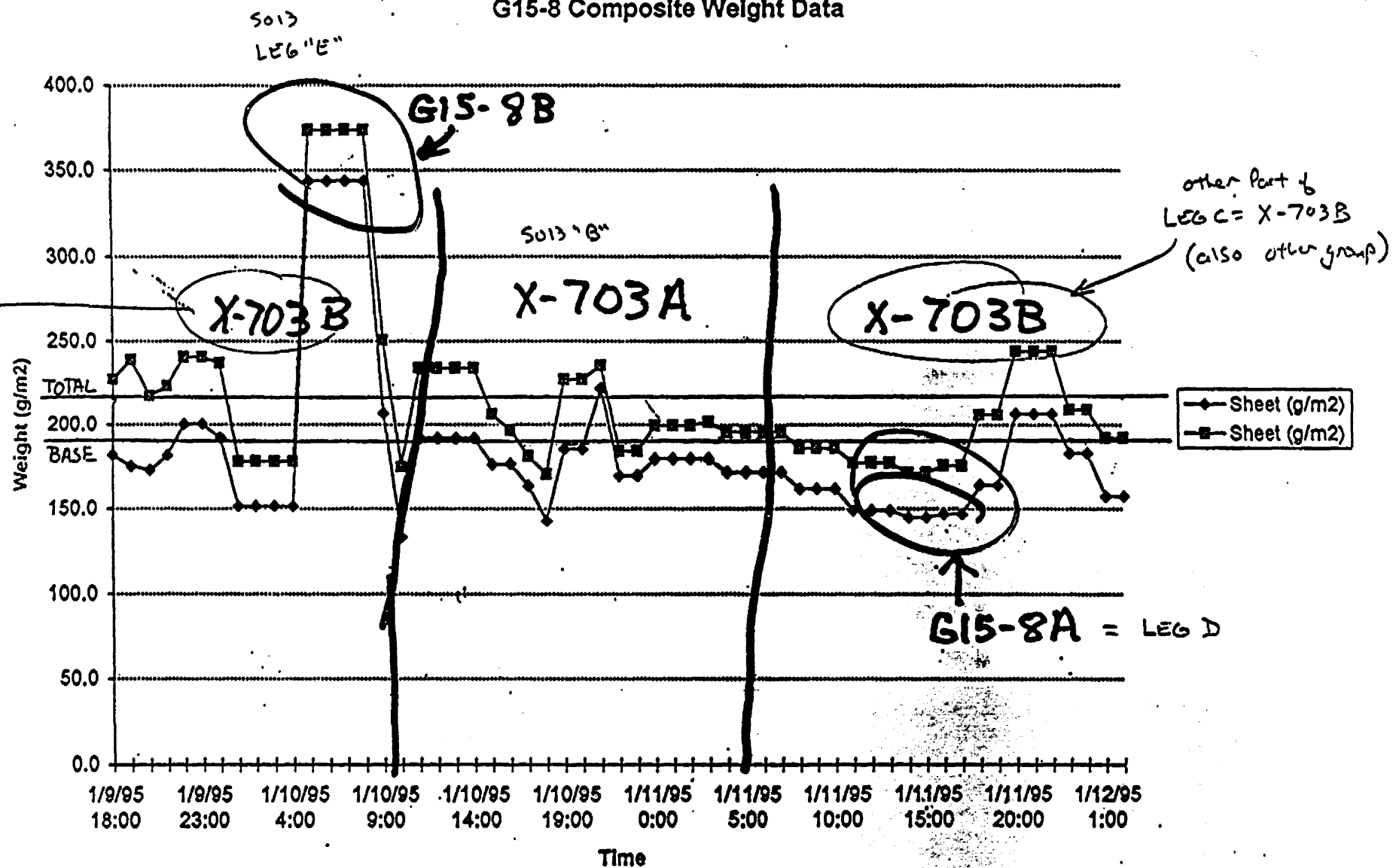
4-57.xls
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Substrate Thickness/ Top Load Percentages

Trial 4-057: Internal Substrate Temperatures

- **Thicker substrate (0.013" vs 0.008") reduced temperature 50°C 5mm behind heat source. [A vs C ; E vs G]**
- **The thinner substrate had a higher propensity to burn as was observed from puffs with aerosol value $\geq 10,000$ units.**
- **Lower top load percentages (10% vs 20%) decreased the temperature 30°C 5mm behind heat source. [A vs E ; C vs G]**
- **Product pressure drop averaged 80-88 mm H₂O which is lower than the targeted range of 95-115 mm H₂O.**

G15-8 Composite Weight Data



SUBSTRATE PRODUCTION SUMMARY

Target			Parameter	Jan	March	Oct 9	Oct 10	Oct 11	Oct 12
174	193	212	Base Sheet, g/m2	184.7	181.0	181.0	169.0	166.0	182.0
164		222	SD	48.2	13.5	18.2	15.2	11.1	8.8
			COV	26.1	7.4	10.0	9.0	6.7	4.8
194	215	236	Total Sheet, g/m2	216.0	206.0	216.0	197.0	196.0	210.0
180		250	SD	49.9	16.4	22.5	16.1	10.6	9.2
			COV	23.1	7.9	10.4	8.2	5.4	4.4
20	22	24	Top Load, g/m2	31.3	24.8	35.0	27.5	29.9	28.6
18		26	SD	10.0	9.5	11.3	9.6	5.6	8.3
			COV	31.8	38.5	32.4	34.7	18.9	29.1

GERMANY TRIAL JANUARY 1995		BASE SHEET			PRODUCT WITH TOP LOAD			
		B-NIC	B-B-3	B-H2O	P-NIC	P-B-3	P-H2O	TOPLOA
	G0:20	0.04	52.23	6.21	0.29	49.39	6.34	5.44
	G1:00	0.13	52.76	6.01	0.6	45.15	5.56	14.42
	G10:30	0.06	44.53	3.93	0.37	42.89	3.9	3.68
	G10:50	0.03	39.52	5	0.44	36.04	4.91	8.81
	G13:00	0.04	51.67	4.67	0.69	40.52	4.02	21.58
	G13:20	0.12	38.68	5.31	0.36	33.87	5.29	12.44
	G15:20	0.04	49.77	4.84	0.31	46.29	4.9	6.99
	G15:30	0.04	45.29	5.02	0.14	42.68	4.98	5.76
	G16:10	0.08	53.01	5.34	0.18	50.38	4.77	4.96
	G18:00	0.04	58.21	4.84	0.2	53.65	4.44	7.83
	G20:00	0.1	50.57	4.73	0.33	47.68	4.53	5.71
	G20:10	0.05	52.27	5.42	0.25	46.09	5.23	11.82
	G22:30	0.06	45.85	5.47	0.17	42.28	5.63	7.79
	G22:45	0.07	50.41	5.15	0.36	43.1	5.06	14.50
	G3:00	0.09	53.99	4.95	0.59	43.92	4.86	18.65
	MEAN	0.07	49.25	5.13	0.35	44.26	4.87	10.03
	STD	0.03	5.43	0.55	0.17	5.15	0.62	5.35
	MIN	0.03	38.68	3.93	0.14	33.87	3.90	3.68
	MAX	0.13	58.21	6.21	0.69	53.65	6.34	21.58
GERMANY (MARCH 1995)		B-NIC	B-B3	B-H2O	P-NIC	P-B3	P-H2O	% TOPLOAD
GN1199AB	2310	0.08	53.53	7.01	0.38	50.58	7.52	5.5
GN1199AD	0	0.11	54.49	7.82	0.38	48.81	7.49	10.4
GN1199AF	1200	0.13	49.77	7.41	0.27	47.17	7.34	5.2
GN1199AH	1616	0.08	50.01	6.52	0.23	48.38	6.6	3.3
GN1199AJ	3301	0.06	51.56	6.61	0.23	46.1	6.76	10.6
GN1199AL	3302	0.03	49.4	6.31	0.21	46.67	6.61	5.5
GN1199AN	1160	0.04	47.63	6.32	0.2	43.58	6.58	8.5
GN1199AO	1616	0.02	50.89	5.19	0.37	46.26	6.47	9.1
GN1199AQ	2320	0.3	52.56	5.78	0.15	50.62	6	3.7
GN1199AS	916	0.1	57.63	5.83	0.26	49.93	5.14	13.4
GN1199AU	1730	0.11	53.8	5.37	0.24	50.09	5.32	6.9
GN1199AW	2220	0.12	54.18	5.82	0.07	52.53	6.71	3.0
GN1199AY	830	0.05	52.69	8.26	0.21	47.06	7.09	10.7
	MEAN	0.09	52.16	6.48	0.25	48.29	6.59	7.37
	STD	0.07	2.66	0.93	0.09	2.44	0.74	3.31
	MIN	0.02	47.63	5.19	0.07	43.58	5.14	3.05
	MAX	0.30	57.63	8.26	0.38	52.53	7.52	13.96
G15-8 MAY		B-NIC	%B-B3	%H2O	P-NIC	P-B3	P-H2O	
GN1912AB	1430	0.1	51.81	8.34	0.28	48.47	8.16	6.4
GN1912AD	2060	0.09	50.95	12.07	0.15	49.16	11.11	3.5
GN1912AF	420	0.11	51.32	10.59	0.21	48.72	8.54	5.1
GN1912AH	1616	0.12	49.59	10.15	0.37	43.58	9.86	12.1
GN1912AJ	700	0.12	52.74	8.02	0.4	45.08	7.61	14.5
GN1912AL	620	0.09	49.12	11.83	0.29	45.3	10.96	7.8
GN1912AN	1400	0.16	46.46	14.42	0.32	43.73	11.16	5.9
GN1912AP	1130	0.11	51.21	7.78	0.29	48	6.8	6.3
	MEAN	0.11	50.40	10.40	0.29	46.51	9.28	7.70
	STD	0.02	1.97	2.33	0.08	2.32	1.72	3.73
	MIN	0.09	46.46	7.78	0.15	43.58	6.80	3.51
	MAX	0.16	52.74	14.42	0.40	49.16	11.16	14.52

ANALYTICAL DATA

GERMANY TRIAL JANUARY 1995			BASE SHEET		PRODUCT WITH TOP LOAD			TOPLOA
		B-NIC	B-B-3	B-H2O	P-NIC	P-B-3	P-H2O	
1	G0:20	.042 0.04	55.47 52.23	6.21	.30 0.29	52.52 49.39	6.34	5.44
2	G1:00	.014 0.13	55.93 52.76	6.01	.63 0.6	47.46 45.15	5.56	14.42
3	G10:30	.062 0.06	46.24 44.53	3.93	.38 0.37	44.54 42.89	3.9	3.68
4	G10:50	.031 0.03	44.49 39.52	5	.46 0.44	37.80 36.04	4.91	8.81
5	G13:00	.042 0.04	54.06 51.67	4.67	.72 0.69	42.44 40.52	4.02	21.58
6	G13:20	.12 0.12	46.73 38.68	5.31	.38 0.36	35.84 33.87	5.29	12.44
7	G15:20	.042 0.04	52.14 49.77	4.84	.32 0.31	48.51 46.29	4.9	6.99
8	G15:30	.042 0.04	47.54 45.29	5.02	.14 0.14	44.80 42.68	4.98	5.76
9	G16:10	.084 0.08	55.04 53.01	5.34	.19 0.18	52.74 50.38	4.77	4.96
10	G18:00	.042 0.04	61.02 58.21	4.84	.20 0.2	56.03 53.65	4.44	7.83
11	G20:00	.16 0.1	52.44 50.57	4.73	.34 0.33	49.03 47.68	4.53	5.71
12	G20:10	.057 0.05	55.10 52.27	5.42	.26 0.25	48.50 46.09	5.23	11.82
13	G22:30	.063 0.06	48.35 45.85	5.47	.18 0.17	44.44 42.28	5.63	7.79
14	G22:45	.073 0.07	53.00 50.41	5.15	.37 0.36	45.26 43.1	5.06	14.50
15	G3:00	.094 0.09	56.66 53.99	4.95	.60 0.59	46.09 43.92	4.96	18.65
	MEAN	.073 0.07	51.11 49.25	5.13	.36 0.35	46.41 44.26	4.97	10.03
	STD	0.03	5.15 5.43	0.55	.17 0.17	5.38 5.15	0.62	5.35
	MIN	0.03	38.68	3.93	0.14	33.87	3.90	3.68
	MAX	0.13	58.21	6.21	0.69	53.65	6.34	21.58
GERMANY (MARCH 1995)			B-B3	B-H2O	P-NIC	P-B3	P-H2O	% TOPLOAD
GN1199AB	16 1 2310	.085 0.08	57.28 53.53	7.01	.40 0.38	54.38 50.58	7.52	5.5
GN1199AD	17 2 0	.12 0.11	58.75 54.49	7.82	.40 0.38	52.46 48.81	7.49	10.4
GN1199AF	18 3 1200	.14 0.13	53.45 49.77	7.41	.29 0.27	50.63 47.17	7.34	5.2
GN1199AH	19 4 1616	.085 0.08	53.27 50.01	6.52	.24 0.23	51.57 48.38	6.6	3.3
GN1199AJ	20 5 3301	.069 0.06	54.94 51.56	6.61	.24 0.23	49.21 46.1	6.76	10.6
GN1199AL	21 6 3302	.031 0.03	52.50 49.4	6.31	.22 0.21	49.75 46.67	6.61	5.5
GN1199AN	22 7 1150	.042 0.04	50.64 47.63	6.32	.21 0.2	46.44 43.58	6.58	8.5
GN1199AO	23 8 1616	.021 0.02	53.53 50.89	5.19	.39 0.37	49.25 46.26	6.47	9.1
GN1199AQ	24 9 2320	.031 0.03	55.59 52.56	5.78	.16 0.15	53.65 50.62	6	3.7
GN1199AS	25 10 916	.10 0.1	60.98 57.63	5.83	.27 0.26	52.49 49.93	5.14	13.4
GN1199AU	26 11 1730	.11 0.11	56.66 53.8	5.37	.25 0.24	52.75 50.09	5.32	6.9
GN1199AW	27 12 2220	.12 0.12	51.33 54.18	5.82	.07 0.07	56.05 52.53	6.71	3.0
GN1199AY	28 13 830	.054 0.05	51.04 52.69	8.26	.22 0.21	50.39 47.06	7.09	10.7
	MEAN	.077 0.09	55.94 52.16	6.48	.32 0.25	48.51 48.29	6.59	7.37
	STD	.039 0.07	2.83 2.66	0.93	.14 0.09	4.81 2.44	0.74	3.31
	MIN	0.02	47.63	5.19	0.07	43.58	5.14	3.05
	MAX	0.30	57.63	8.26	0.38	52.53	7.52	13.36
G15-8 MAY			%B-B3	%H2O	P-NIC	P-B3	P-H2O	
GN1912AB	29 14 1430	.10 0.1	56.13 51.81	8.34	.30 0.28	52.42 48.47	8.16	6.4
GN1912AD	30 15 2050	.10 0.09	57.07 50.95	12.07	.16 0.15	54.62 49.16	11.11	3.5
GN1912AF	31 16 420	.12 0.11	56.75 51.32	10.59	.22 0.21	52.88 48.72	8.54	5.1
GN1912AH	32 17 1616	.13 0.12	54.62 49.59	10.15	.40 0.37	47.87 43.58	9.86	12.1
GN1912AJ	33 18 700	.13 0.12	56.96 52.74	8.02	.43 0.4	48.51 45.08	7.61	14.5
GN1912AL	34 19 620	.10 0.09	54.93 49.12	11.83	.32 0.29	50.16 45.3	10.96	7.8
GN1912AN	35 20 1400	.18 0.16	53.16 46.46	14.42	.35 0.32	48.61 43.73	11.16	5.9
GN1912AP	36 21 1130	.12 0.11	55.19 51.21	7.78	.30 0.29	51.26 48	6.8	6.3
	MEAN	.12 0.11	55.60 50.40	10.40	.32 0.29	49.04 46.51	9.28	7.70
	STD	.024 0.02	1.37 1.97	2.33	.13 0.08	4.46 2.32	1.72	3.73
	MIN	0.09	46.46	7.78	0.15	43.58	6.80	3.51
	MAX	0.16	52.74	14.42	0.40	49.16	11.16	14.52

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B- {Base sheet}

P- {Product/G15-8}

ANALYTICAL DATA

GERMANY TRIAL JANUARY 1995		BASE SHEET			PRODUCT WITH TOP LOAD			
		B-NIC	B-B-3	B-H2O	P-NIC	P-B-3	P-H2O	TOPLOA
	G0:20	0.04	52.23	6.21	0.29	49.39	6.34	5.44
	G1:00	0.13	52.76	6.01	0.6	45.15	5.56	14.42
	G10:30	0.06	44.53	3.93	0.37	42.89	3.9	3.68
	G10:50	0.03	39.52	5	0.44	38.04	4.91	8.81
	G13:00	0.04	51.67	4.67	0.69	40.52	4.02	21.58
	G13:20	0.12	38.68	5.31	0.36	33.87	5.29	12.44
	G15:20	0.04	49.77	4.84	0.31	46.29	4.9	6.99
	G15:30	0.04	45.29	5.02	0.14	42.68	4.98	5.76
	G16:10	0.08	53.01	5.34	0.18	50.38	4.77	4.96
	G18:00	0.04	58.21	4.84	0.2	53.65	4.44	7.83
	G20:00	0.1	50.57	4.73	0.33	47.68	4.53	5.71
	G20:10	0.05	52.27	5.42	0.25	46.09	5.23	11.82
	G22:30	0.06	45.85	5.47	0.17	42.28	5.63	7.79
	G22:45	0.07	50.41	5.15	0.36	43.1	5.06	14.50
	G3:00	0.09	53.99	4.95	0.59	43.92	4.98	18.65
	MEAN	0.07	49.25	5.13	0.35	44.26	4.97	10.03
	STD	0.03	5.43	0.55	0.17	5.15	0.62	5.35
	MIN	0.03	38.68	3.93	0.14	33.87	3.90	3.68
	MAX	0.13	58.21	6.21	0.69	53.65	6.34	21.58
GERMANY (MARCH 1995)		B-NIC	B-B3	B-H2O	P-NIC	P-B3	P-H2O	% TOPLOAD
GN1199AB	2310	0.08	53.53	7.01	0.38	50.58	7.52	5.5
GN1199AD	0	0.11	54.49	7.82	0.38	48.81	7.49	10.4
GN1199AF	1200	0.13	49.77	7.41	0.27	47.17	7.34	5.2
GN1199AH	1616	0.08	50.01	6.52	0.23	48.38	6.6	3.3
GN1199AJ	3301	0.06	51.56	6.61	0.23	46.1	6.76	10.6
GN1199AL	3302	0.03	49.4	6.31	0.21	46.67	6.61	5.5
GN1199AN	1160	0.04	47.63	6.32	0.2	43.58	6.58	8.5
GN1199AO	1616	0.02	50.89	5.19	0.37	46.26	6.47	9.1
GN1199AQ	2320	0.3	52.56	5.78	0.15	50.62	6	3.7
GN1199AS	916	0.1	57.63	5.83	0.26	49.93	5.14	13.4
GN1199AU	1730	0.11	53.8	5.37	0.24	50.09	5.32	6.9
GN1199AW	2220	0.12	54.18	5.62	0.07	52.53	6.71	3.0
GN1199AY	830	0.05	52.69	8.26	0.21	47.06	7.09	10.7
	MEAN	0.09	52.16	6.48	0.26	48.29	6.69	7.37
	STD	0.07	2.66	0.93	0.09	2.44	0.74	3.31
	MIN	0.02	47.63	5.19	0.07	43.58	5.14	3.05
	MAX	0.30	57.63	8.26	0.38	52.53	7.52	13.36
G16-8 MAY		B-NIC	%B-B3	%H2O	P-NIC	P-B3	P-H2O	
GN1912AB	1430	0.1	51.81	6.34	0.28	48.47	8.16	6.4
GN1912AD	2060	0.09	50.95	12.07	0.15	49.16	11.11	3.5
GN1912AF	420	0.11	51.32	10.59	0.21	48.72	8.54	5.1
GN1912AH	1616	0.12	49.59	10.15	0.37	43.58	9.86	12.1
GN1912AJ	700	0.12	52.74	8.02	0.4	45.06	7.61	14.5
GN1912AL	620	0.09	49.12	11.83	0.29	45.3	10.96	7.8
GN1912AN	1400	0.16	46.46	14.42	0.32	43.73	11.16	5.9
GN1912AP	1130	0.11	51.21	7.78	0.29	48	6.8	6.3
	MEAN	0.11	50.40	10.40	0.29	46.51	9.28	7.70
	STD	0.02	1.97	2.33	0.08	2.32	1.72	3.73
	MIN	0.09	46.46	7.78	0.15	43.58	6.80	3.51
	MAX	0.16	52.74	14.42	0.40	49.16	11.16	14.52

B- {Base sheet}

P- {Product/G15-8}

Source: <https://www.industrydocuments.ucsf.edu/docs/fqhx0232>

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