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SFUND RECORDS CTR
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Lab/Cor, Inc.

A Professional Service Corporation in the Northwest

Wednesday, June 29, 2005

Lab/Cor Report Number: *051020R01*

Howard Edwards
Ecology and Environment, Inc.
350 Sansome
Ste 300
San Francisco CA 94104

Phone: 415-981-2811
Fax: 415-981-0801

Project Name: Glass Filter Blanks - El Dorado Indirects
Project Number:
Client Reference:
Sample Receipt Date: 6/6/2005

Enclosed please find results for samples submitted to our laboratory. A list of samples and analyses follows:

Lab/Cor Analysis #	Client Sample # and Description	Analysis Type and Notes
Batch #: ***B5651***		
S1-A1	041188-08 Glass Filter Blank of 041188-08	ISO 10312, direct
S2-A1	041188-86 Glass Filter Blank of 041188-86	ISO 10312, direct
S3-A1	041188-111 Glass Filter Blank of 041188-111	ISO 10312, direct
S4-A1	041191-108 Glass Filter Blank of 041191-108	ISO 10312, direct

ISO 10312, direct

Preparation and analysis of the above samples was conducted in accordance with the ISO method 10312 (Direct) for the identification of asbestos. Briefly, the samples were collapsed with acetone, then etched in a low temperature plasma etcher to remove the top surface of the filter and other organics. The samples were carbon coated at high vacuum with a thin layer of carbon, placed on 200 mesh copper grids and allowed to dissolve in acetone until cleared of filter debris.

TEM analysis was performed using a transmission electron microscope equipped with an EDS X ray analyzer. The air samples were analyzed at various approximate screen magnifications of 5,000x for PCM equivalent structures, 10,000x for asbestos structures greater than 5.0 micrometer lengths, and 20,000x for asbestos structures greater than 0.5 micrometer lengths. An accelerating voltage of 100 KV was applied. The sizing of grid openings was performed on the microscope at a magnification of approximately 550X.

Disclaimer

This test report relates only to the items tested in this report. Interpretation of these results is the sole responsibility of the client.

If further clarification of these results is needed, please call us. Thank you for allowing the staff at Lab/Cor, Inc. the opportunity to provide you with analytical services.

Sincerely,

7619 6th Ave NW, Seattle WA 98117 (206) 781-0155 (Office) (206) 789-8424 (Fax)
mail@labcor.net

John Harris, M.P.H.
Laboratory Director

Lab/Cor, Inc.

A Professional Service Corporation in the Northwest

Report # 051020R01

Client: Ecology and Environment, Inc.

Project Name: Glass Filter Blanks - El Dorado Indirects

ANALYSIS DETAIL

Lab/Cor Sample No. B5651 S1 A1
Client Sample No. 041188-08
Description Glass Filter Blank of 041188-08
Analysis Date 6/7/2005
Analyst KM

Volume (L) 0
No. of Grid Openings 22
Filter Area (mm2) 385
Area Analyzed (mm2) 0.319
Analytical Sens. (struc/cc) NA
Dectection Limit. (struc/cc) NA

Structure Type	Filter Density (s/mm2)	Concen-tration (struc/cc)	95% Confidence Interval (struc/cc)	Struc. Count
Primary Asbestos Structures	0.0	NA	NA	0
Primary Asb & Other Amph Structures	0.0	NA	NA	0
Total Asbestos Structures	0.0	NA	NA	0
Total Asb & Other Amph Structures	0.0	NA	NA	0

Lab/Cor Sample No. B5651 S2 A1
Client Sample No. 041188-86
Description Glass Filter Blank of 041188-86
Analysis Date 6/7/2005
Analyst KM

Volume (L) 0
No. of Grid Openings 44
Filter Area (mm2) 385
Area Analyzed (mm2) 0.638
Analytical Sens. (struc/cc) NA
Dectection Limit. (struc/cc) NA

Structure Type	Filter Density (s/mm2)	Concen-tration (struc/cc)	95% Confidence Interval (struc/cc)	Struc. Count
Primary Asbestos Structures	0.0	NA	NA	0
Primary Asb & Other Amph Structures	0.0	NA	NA	0
Total Asbestos Structures	0.0	NA	NA	0
Total Asb & Other Amph Structures	0.0	NA	NA	0

Lab/Cor, Inc.

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Report # 051020R01

Client: Ecology and Environment, Inc.

Project Name: Glass Filter Blanks - El Dorado Indirects

ANALYSIS DETAIL

Lab/Cor Sample No. B5651 S3 A1
Client Sample No. 041188-111
Description Glass Filter Blank of 041188-111
Analysis Date 6/8/2005
Analyst KM

Volume (L) 0
No. of Grid Openings 46
Filter Area (mm2) 385
Area Analyzed (mm2) 0.667
Analytical Sens. (struc/cc) NA
Dectection Limit. (struc/cc) NA

Structure Type	Filter Density (s/mm2)	Concen-tration (struc/cc)	95% Confidence Interval (struc/cc)	Struc. Count
Primary Asbestos Structures	0.0	NA	NA	0
Primary Asb & Other Amph Structures	0.0	NA	NA	0
Total Asbestos Structures	0.0	NA	NA	0
Total Asb & Other Amph Structures	0.0	NA	NA	0

Lab/Cor Sample No. B5651 S4 A1
Client Sample No. 041191-108
Description Glass Filter Blank of 041191-108
Analysis Date 6/9/2005
Analyst KM

Volume (L) 0
No. of Grid Openings 56
Filter Area (mm2) 385
Area Analyzed (mm2) 0.811
Analytical Sens. (struc/cc) NA
Dectection Limit. (struc/cc) NA

Structure Type	Filter Density (s/mm2)	Concen-tration (struc/cc)	95% Confidence Interval (struc/cc)	Struc. Count
Primary Asbestos Structures	0.0	NA	NA	0
Primary Asb & Other Amph Structures	0.0	NA	NA	0
Total Asbestos Structures	0.0	NA	NA	0
Total Asb & Other Amph Structures	0.0	NA	NA	0

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A Professional Service Corporation in the Northwest

Report # 051020R01

Client: Ecology and Environment, Inc.

Project Name: Glass Filter Blanks - El Dorado Indirects

TEM ASBESTOS STRUCTURE COUNT - RAW DATA

Sample No.: 041188-08 *Lab/Cor Sample No.:* B5651 S1 A1

Descripiton: Glass Filter Blank of 041188-08

Gr	No.	Loc.	ID	Prim	Tot	Class	Len	Wid	Asp	Neg#	EDS#	Comment	Count Categories
A	1	A31		NSD									
A	2	A11		NSD									
A	3	D1		NSD									
A	4	D21		NSD									
A	5	D41		NSD									
A	6	B31		NSD									
A	7	B11		NSD									
A	8	C1		NSD									
A	9	C21		NSD									
A	10	C41		NSD									
A	11	D10		NSD									
A	12	C20		NSD									
B	13	B41		NSD									
B	14	B11		NSD									
B	15	C11		NSD									
B	16	C41		NSD									
B	17	B44		NSD									
B	18	B14		NSD									
B	19	C14		NSD									
B	20	C44		NSD									
B	21	A1		NSD									
B	22	D21		NSD									

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Report # 051020R01

Client: Ecology and Environment, Inc.
Project Name: Glass Filter Blanks - El Dorado Indirects

TEM ASBESTOS STRUCTURE COUNT - RAW DATA

Sample No.: 041188-86 *Lab/Cor Sample No.:* B5651 S2 A1
Descripiton: Glass Filter Blank of 041188-86

Gr	No.	Loc.	ID	Prim	Tot	Class	Len	Wid	Asp	Neg#	EDS#	Comment	Count Categories
A	1	A43		NSD									
A	2	A23		NSD									
A	3	A3		NSD									
A	4	D13		NSD									
A	5	D33		NSD									
A	6	D41		NSD									
A	7	D21		NSD									
A	8	D1		NSD									
A	9	A11		NSD									
A	10	A31		NSD									
A	11	B44		NSD									
A	12	B24		NSD									
A	13	B4		NSD									
A	14	C14		NSD									
A	15	C34		NSD									
A	16	C42		NSD									
A	17	C22		NSD									
A	18	C2		NSD									
A	19	B12		NSD									
A	20	B32		NSD									
A	21	A10		NSD									
A	22	C10		NSD									
B	23	B44		NSD									
B	24	B24		NSD									
B	25	B4		NSD									
B	26	C14		NSD									
B	27	C34		NSD									
B	28	C41		NSD									
B	29	C21		NSD									
B	30	C1		NSD									
B	31	B11		NSD									
B	32	B31		NSD									
B	33	A42		NSD									
B	34	A22		NSD									

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Report # 051020R01

Client: Ecology and Environment, Inc.

Project Name: Glass Filter Blanks - El Dorado Indirects

TEM ASBESTOS STRUCTURE COUNT - RAW DATA

Sample No.: 041188-86 *Lab/Cor Sample No.:* B5651 S2 A1

Descripiton: Glass Filter Blank of 041188-86

Gr	No.	Loc.	ID	Prim	Tot	Class	Len	Wid	Asp	Neg#	EDS#	Comment	Count Categories
B	35	A2		NSD									
B	36	D12		NSD									
B	37	D32		NSD									
B	38	D44		NSD									
B	39	D24		NSD									
B	40	D4		NSD									
B	41	A34		NSD									
B	42	B10		NSD									
B	43	C20		NSD									
B	44	D40		NSD									

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Report # 051020R01

Client: Ecology and Environment, Inc.
Project Name: Glass Filter Blanks - El Dorado Indirects

TEM ASBESTOS STRUCTURE COUNT - RAW DATA

Sample No.: 041188-111 *Lab/Cor Sample No.:* B5651 S3 A1
Descripiton: Glass Filter Blank of 041188-111

Gr	No.	Loc.	ID	Prim	Tot	Class	Len	Wid	Asp	Neg#	EDS#	Comment	Count Categories
A	1	B44		NSD									
A	2	B24		NSD									
A	3	B4		NSD									
A	4	C14		NSD									
A	5	C23		NSD									
A	6	C3		NSD									
A	7	B13		NSD									
A	8	B33		NSD									
A	9	B42		NSD									
A	10	B22		NSD									
A	11	B2		NSD									
A	12	C12		NSD									
A	13	C32		NSD									
A	14	C41		NSD									
A	15	C21		NSD									
A	16	C1		NSD									
A	17	B11		NSD									
A	18	B31		NSD									
A	19	D11		NSD									
A	20	D31		NSD									
A	21	D41		NSD									
A	22	A12		NSD									
A	23	D2		NSD									
B	24	A44		NSD									
B	25	A24		NSD									
B	26	A4		NSD									
B	27	D14		NSD									
B	28	D34		NSD									
B	29	D43		NSD									
B	30	D23		NSD									
B	31	D3		NSD									
B	32	A13		NSD									
B	33	A33		NSD									
B	34	A42		NSD									

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Report # 051020R01

Client: Ecology and Environment, Inc.

Project Name: Glass Filter Blanks - El Dorado Indirects

TEM ASBESTOS STRUCTURE COUNT - RAW DATA

Sample No.: 041188-111 *Lab/Cor Sample No.:* B5651 S3 A1

Descripiton: Glass Filter Blank of 041188-111

Gr	No.	Loc.	ID	Prim	Tot	Class	Len	Wid	Asp	Neg#	EDS#	Comment	Count Categories
B	35	A22		NSD									
B	36	A2		NSD									
B	37	D12		NSD									
B	38	D32		NSD									
B	39	D41		NSD									
B	40	D21		NSD									
B	41	D1		NSD									
B	42	A11		NSD									
B	43	A31		NSD									
B	44	B1		NSD									
B	45	C21		NSD									
B	46	C41		NSD									

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Report # 051020R01

Client: Ecology and Environment, Inc.
Project Name: Glass Filter Blanks - El Dorado Indirects

TEM ASBESTOS STRUCTURE COUNT - RAW DATA

Sample No.: 041191-108 *Lab/Cor Sample No.:* B5651 S4 A1
Descripiton: Glass Filter Blank of 041191-108

Gr	No.	Loc.	ID	Prim	Tot	Class	Len	Wid	Asp	Neg#	EDS#	Comment	Count Categories
A	1	C44		NSD									
A	2	C24		NSD									
A	3	C4		NSD									
A	4	B14		NSD									
A	5	B34		NSD									
A	6	B23		NSD									
A	7	C3		NSD									
A	8	C23		NSD									
A	9	C43		NSD									
A	10	B42		NSD									
A	11	B12		NSD									
A	12	C2		NSD									
A	13	C32		NSD									
A	14	C42		NSD									
A	15	B41		NSD									
A	16	D1		NSD									
A	17	D21		NSD									
A	18	D31		NSD									
A	19	A41		NSD									
A	20	A21		NSD									
A	21	A1		NSD									
A	22	D11		NSD									
A	23	D31		NSD									
A	24	D2		NSD									
A	25	D22		NSD									
A	26	D23		NSD									
A	27	D43		NSD									
A	28	A13		NSD									
B	29	A44		NSD									
B	30	A24		NSD									
B	31	A4		NSD									
B	32	D14		NSD									
B	33	D34		NSD									
B	34	D43		NSD									

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Report # 051020R01

Client: Ecology and Environment, Inc.

Project Name: Glass Filter Blanks - El Dorado Indirects

TEM ASBESTOS STRUCTURE COUNT - RAW DATA

Sample No.: 041191-108 *Lab/Cor Sample No.:* B5651 S4 A1

Descripiton: Glass Filter Blank of 041191-108

Gr	No.	Loc.	ID	Prim	Tot	Class	Len	Wid	Asp	Neg#	EDS#	Comment	Count Categories
B	35	D23		NSD									
B	36	D3		NSD									
B	37	A13		NSD									
B	38	A33		NSD									
B	39	A42		NSD									
B	40	A22		NSD									
B	41	A2		NSD									
B	42	D12		NSD									
B	43	D32		NSD									
B	44	D41		NSD									
B	45	D21		NSD									
B	46	D1		NSD									
B	47	A11		NSD									
B	48	A31		NSD									
B	49	B21		NSD									
B	50	B1		NSD									
B	51	C11		NSD									
B	52	C31		NSD									
B	53	C42		NSD									
B	54	C22		NSD									
B	55	C2		NSD									
B	56	B12		NSD									

NSD = No Structures Detected
PAS = Primary Asbestos Structures
PAOS = Primary Asb _Other Amph Structures
TAS = Total Asbestos Structures
TAOS = Total Asb Other Amph Structures
PCMEF-US = PCM Equivalent Fibers-US
PCMES-US = PCM Equivalent Structures-US
PCMEF-ISO = PCM Equivalent Fibers-ISO
PCMES-ISO = PCM Equivalent Structures-ISO
PSAS 5-10 = PROTOCOL ASB STRUCS 5-10
PSAS >10 = PROTOCOL ASB STRUCS >10

CF = Cleavage Fragments
TS = Transitional Structures

PSAS TOT = PROTOCOL ASB STRUC TOTAL
PSAOS 5-10 = PROTOCOL ASB/OTHER AMPH 5-10
PSAOS>10 = PROTOCOL ASB/OTHER AMPH >10
PSAOS TOT=PROTOCOL ASB/OTHER AMPH TOTAL
PSCH 5-10 = PROTOCOL CHRYS STRUCS 5-10
PSCH >10 = PROTOCOL CHRYS STRUCS >10
PSCH TOT = PROTOCOL CHRYS STRUCS TOTAL
PSAM 5-10 = PROTOCOL AMPH STRUCS 5-10
PSAM >10 = PROTOCOL AMPH STRUCS >10
PSAM TOT = PROTOCOL AMPH STRUCS TOTAL
PSOS 5-10 = PROTOCOL OTHER AMPH 5-10
PSOS >10 = PROTOCOL OTHER AMPH >10
PSOS TOT = PROTOCOL OTHER AMPH TOTAL

TAS_AHRA = AHERA-like Total Strucs 3:1
AS>5_AHRA = AHERA-like Asb Strucs >5 and 3:1
AS5-10_AHRA = AHERA-like Asb Strucs 5 - 10 and 3:1
AS>10_AHRA = AHERA-like Asb Strucs >10 and 3:1
TOS_AHRA = Total Other Amphibole Strucs 3:1
OS>5_AHRA = Other Amphibole Struc >5 and 3:1
OS5-10_AHRA = Other Amphibole Struc 5 - 10 and 3:1
OS>10_AHRA = Other Amphibole Strucs >10 and 3:1
AS>5 = Asbestos Structures > 5um
AFB>5 = Asbestos Fibers and Bundles > 5um

PChS = Primary Chrysotile Structures
PAmS = Primary Amphibole Structures

Lab/Cor, Inc.

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051021-El Dorado

Indirect Sample Prep Log

Job #	Client ID #	Original L/C Job #	Ash Date	Ash Tech	Ash Time	Hydrolyzed Date	Hydrolyzed Time	Prep Date	Prep Tech
051021-01	NFB-L2-1ZB-100504	041188-84	6/4/2005	MH	13:30	6/4/2005	17:10	6/8/2005	MH
051021-02	SFBA-L2-FB-100504	041188-95	6/4/2005	MH	13:30	6/4/2005	17:10	6/8/2005	MH
051021-03	SFBB-L2-1ZB-100604	041188-105	6/4/2005	MH	13:30	6/4/2005	17:10	6/8/2005	MH
051021-04	NYB-L2-1ZB-100704	041191-31	6/4/2005	MH	13:30	6/4/2005	17:10	6/8/2005	MH
051021-05	JEG-L2-1ZB-101004	041191-52	6/4/2005	MH	17:45	6/5/2005	11:20	6/8/2005	MH
051021-06	JEG-L2-FB-101004	041191-57	6/4/2005	MH	17:45	6/5/2005	11:20	6/8/2005	MH
051021-07	SRA-1ZB-100804	041210-51	6/4/2005	MH	17:45	6/5/2005	11:20	6/8/2005	MH
051021-08	NRA-FB-101004	041210-54	6/4/2005	MH	17:45	6/5/2005	11:20	6/8/2005	MH

QC Supervisor,

Kate March

QC Technician,

Minh Huynh

Lab/Cor, Inc.

A Professional Service Corporation in the Northwest

051021 El Dorado

Indirect Sample Prep List

Prepped	Prep Tech	Client ID #	L/C Job #	L/C Original Job #	Sample Vol. (L)	Original Filter Area (mm2)	Test Filter Area (mm2)	FF Remain	FF Used	Visual Loading	Number of Grid Openings	Residual Volume (ml)	Aliquot (ml)	Dilution
6/8/2005	MH	NFB-L2-1ZB-100504	051021-01	041188-84	301.29	385	193	0.89	0.5	0.1	89	20	20	1:1
6/8/2005	MH	SFBA-L2-FB-100504	051021-02	041188-95	0.00	385	193	0.89	0.5	0.1	9	20	20	1:1
6/8/2005	MH	SFBB-L2-1ZB-100604	051021-03	041188-105	308.75	385	193	0.89	0.5	0.1	86	20	20	1:1
6/8/2005	MH	NYB-L2-1ZB-100704	051021-04	041191-31	302.05	385	193	0.89	0.5	0.1	88	20	20	1:1
6/8/2005	MH	JEG-L2-1ZB-101004	051021-05	041191-52	299.29	385	193	0.89	0.5	0.1	88	20	20	1:1
6/8/2005	MH	JEG-L2-FB-101004	051021-06	041191-57	299.90	385	193	0.89	0.5	0.1	94	20	20	1:1
6/8/2005	MH	SRA-1ZB-1008004	051021-07	041210-51	6655.05	385	193	0.89	0.5	0.1	13	20	20	1:1
6/8/2005	MH	NRA-FB-101004	051021-08	041210-54	0.00	385	193	0.89	0.5	0.1	9	20	20	1:1
6/8/2005	MH		051021-QC					NA						

QC Supervisor,

Kate March

QC Technician,

Minh Huynh

Lab/Cor, Inc.

A Professional Service Corporation in the Northwest

051020 El Dorado

Column Blank Prep List

Lab/Cor ID #	Client ID #	New Lab/Cor ID #	Original Filter Date	Filter Prepper	Sample Prep Date	Prep Tech
041188-08	CC5-H6-1CP-100604	051020-01	1/21/2005	MH	6/1/2005	MH
041188-86	SFBA-H2-2PG-100504	051020-02	3/22/2005	MH	6/1/2005	MH
041188-111	SFBC-H2-4PG-100604	051020-03	3/22/2005	MH	6/1/2005	MH
041191-108	JEG-H2-1FD-101004	051020-04	3/7/2005	MH	6/1/2005	MH

QC Supervisor,

Kate March

QC Technician,

Minh Huynh

Lab/Cor, Inc.

A Professional Service Corporation in the Northwest

Microscope Based Quality Control Summary Table
May 2005

	Historical Averages (Philips 410LS)						Historical Averages (Jeol 1200)					
Mag	Freq	MAvg	HAvg	Accpt	Date	Status	Freq	MAvg	HAvg	Accpt	Date	Status
- 550x	Mthly	548.39	565	PASS	5/4/2005	DONE	Mthly	4750	**		5/4/2005	DONE
- 10K	Mthly	9990.6	10410	PASS	5/4/2005	DONE	Mthly	9634	**		5/4/2005	DONE
- 18K	Mthly	17544	18041	PASS	5/4/2005	DONE	Mthly	18816	**		5/4/2005	DONE
EDS												
-(K-factor)Mg:Fe	BiYrly	1.35	1.5	PASS	1/11/2005	DONE	BiYrly	0.74	1.5	PASS	3/14/2005	DONE
-Mn Resol.	Mthly	153	175	PASS	5/6/2005	DONE	Mthly	154	175	PASS	5/4/2005	DONE
Misc. Calibrations												
CL	Wkly	718.93	723	PASS	5/5/2005	DONE	Wkly	805.53	**		5/20/2005	DONE
Spot	Qrtly	166.3	250	PASS	2/9/2005	DONE	Qrtly	180.4	250	PASS	3/16/2005	DONE
Dose	Qrtly			PASS	5/6/2005	DONE	Qrtly			PASS	3/18/2005	DONE
SRM 1876b	Yrly			PASS	5/9/2005	DONE	Yrly			PASS	7/1/2004	DONE
Albite Std	BiYrly			PASS	1/7/2005	DONE	BiYrly			PASS	1/7/2005	DONE
Na Croc. Std Peak	Mthly			PASS	5/6/2005	DONE	Mthly			PASS	5/4/2005	DONE
Plasma Asher	BiYrly			PASS	3/18/2005	DONE	BiYrly			PASS	3/18/2005	DONE
Deficiency Corrections		None										
Sample Custody Errors		None										

**No Historical Average available.

Lab/Cor, Inc.

A Professional Service Corporation in the Northwest

Microscope Based Quality Control Summary Table
June 2005

	Historical Averages (Philips 410LS)						Historical Averages (Jeol 1200)					
Mag	Freq	MAvg	HAvg	Accpt	Date	Status	Freq	MAvg	HAvg	Accpt	Date	Status
- 550x	Mthly	548.39	563	PASS	6/6/2005	DONE	Mthly	4854	**		6/9/2005	DONE
- 10K	Mthly	10319	10396	PASS	6/6/2005	DONE	Mthly	9664	**		6/9/2005	DONE
- 18K	Mthly	17906	18036	PASS	6/6/2005	DONE	Mthly	18605	**		6/9/2005	DONE
EDS												
-(K-factor)Mg:Fe	BiYrly	1.35	1.5	PASS	1/11/2005	DONE	BiYrly	0.74	1.5	PASS	3/14/2005	DONE
-Mn Resol.	Mthly	152	175	PASS	6/23/2005	DONE	Mthly	155	175	PASS	6/8/2005	DONE
Misc. Calibrations												
CL	Wkly	723.08	723	PASS	6/6/2005	DONE	Wkly	811.23	**		6/13/2005	DONE
Spot	Qrtly	193	250	PASS	6/22/2005	DONE	Qrtly	180.4	250	PASS	3/16/2005	DONE
Dose	Qrtly			PASS	5/6/2005	DONE	Qrtly			PASS	3/18/2005	DONE
SRM 1876b	Yrly			PASS	5/9/2005	DONE	Yrly			PASS	7/1/2004	DONE
Albite Std	BiYrly			PASS	1/7/2005	DONE	BiYrly			PASS	1/7/2005	DONE
Na Croc. Std Peak	Mthly			PASS	6/6/2005	DONE	Mthly			PASS	6/8/2005	DONE
Plasma Asher	BiYrly			PASS	3/18/2005	DONE	BiYrly			PASS	3/18/2005	DONE
Deficiency Corrections		None										
Sample Custody Errors		None										

**No Historical Average available.

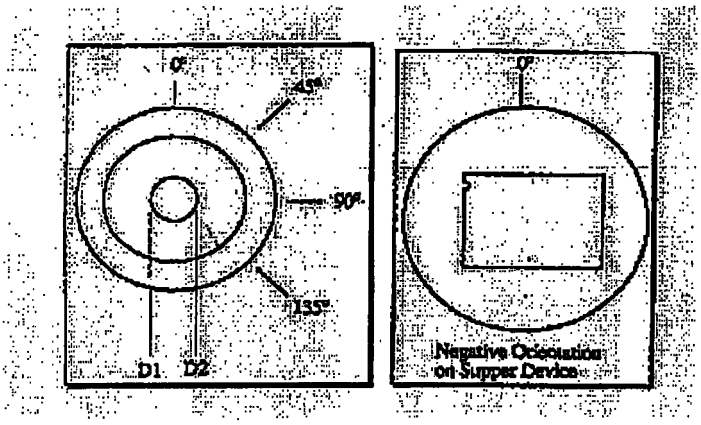
PHILLIPS
JUNE 2005

Camera Length and Camera Constant Calibration (Version#1)

Date of Measurement:	6/11/2005	Average Camera Constant:	26.754 mmA
Negative Number:	5908	(All 12 Measurements)	
Date Negative was Taken:	6/6/2005	Average Camera Length:	723.08 mm
Analyst:	MH	(All 12 Measurements)	

Ring #	0 degrees						45 degrees					
	D_1	D_2	D	R	CC	CL	D_1	D_2	D	R	CC	CL
1	68.33	90.85	22.52	11.26	26.52	716.68	65.10	87.80	22.70	11.35	26.73	722.41
2	66.52	92.55	26.03	13.02	26.54	717.23	63.35	89.55	26.20	13.10	26.71	721.92
3	61.15	97.95	36.80	18.40	26.53	717.10	57.80	94.95	37.15	18.58	26.79	723.92

Ring #	90 degrees						135 degrees					
	D_1	D_2	D	R	CC	CL	D_1	D_2	D	R	CC	CL
1	64.90	87.90	23.00	11.50	27.08	731.96	68.10	90.75	22.65	11.33	26.67	720.82
2	63.18	89.65	26.47	13.24	26.99	729.36	66.30	92.45	26.15	13.08	26.66	720.54
3	57.58	95.10	37.52	18.76	27.05	731.13	60.80	97.95	37.15	18.58	26.79	723.92



Measure the first three rings moving outward from the central spot of the diffraction pattern.

D_1 = The smaller measurement on the Supper device (mm).

D_2 = The larger measurement on the Supper device (mm).

$D = D_2 - D_1$

$R = D/2$

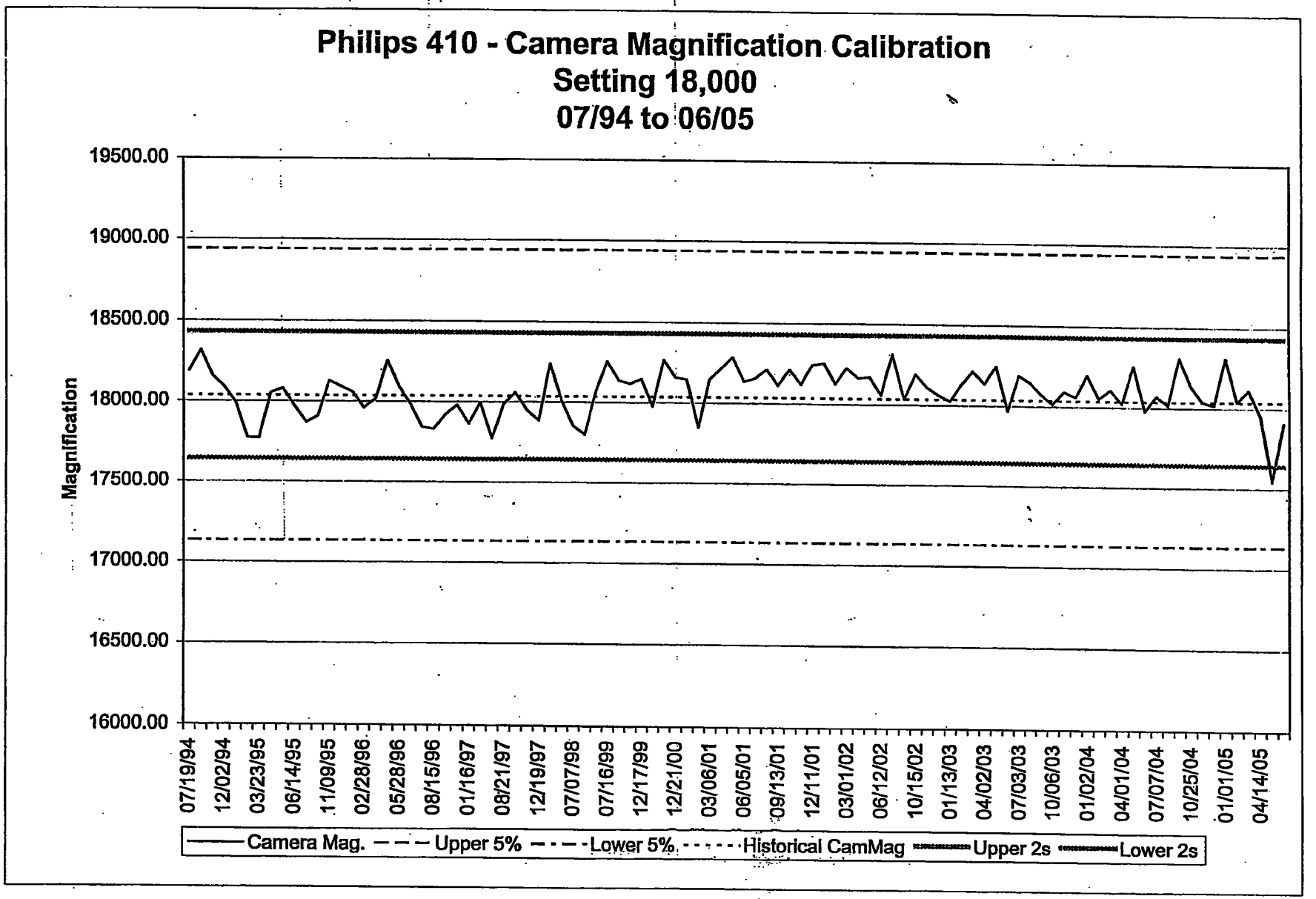
CC = Camera Constant

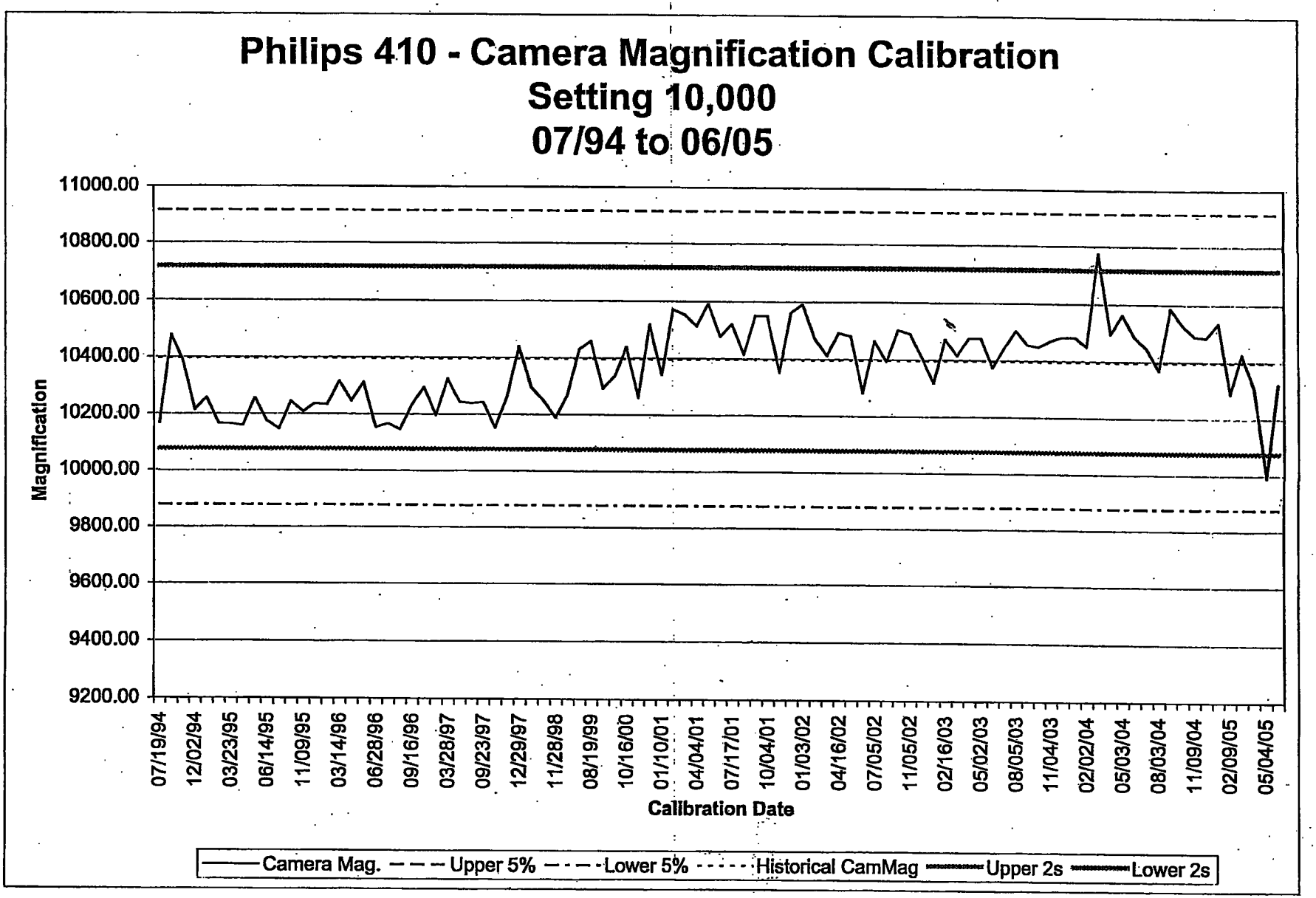
For Ring 1 [111], CC = R*2.355

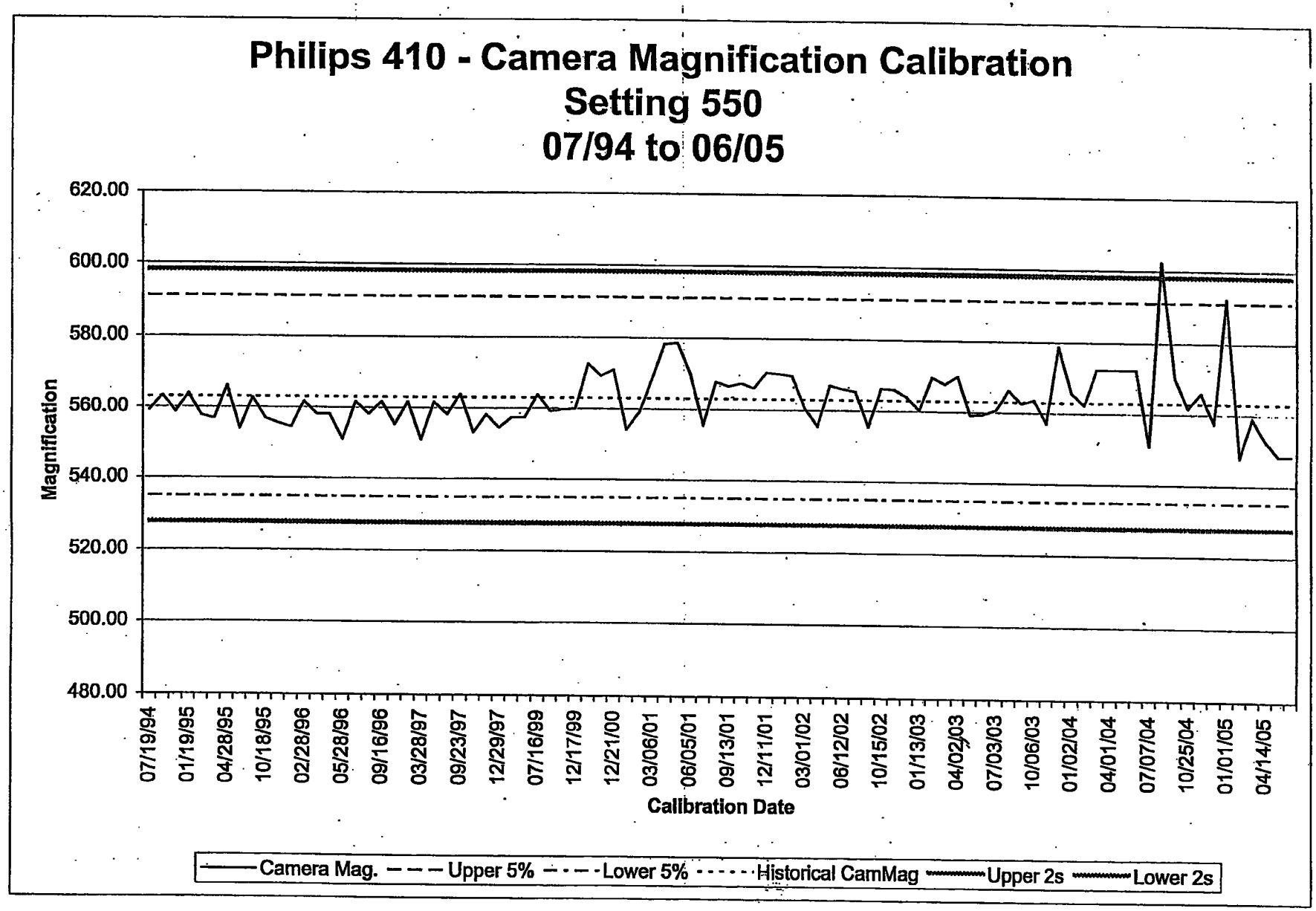
For Ring 2 [200], CC = R*2.039

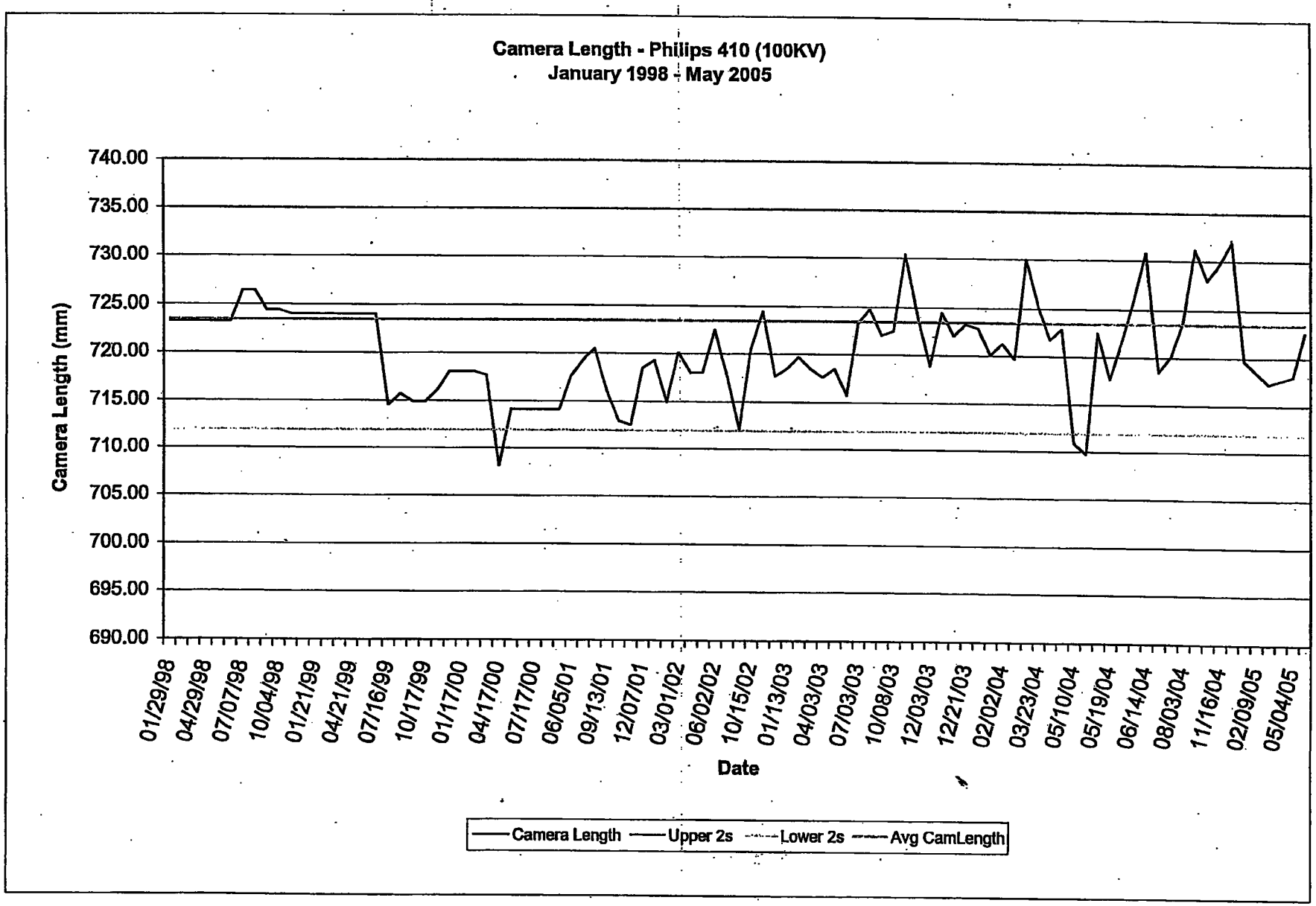
For Ring 3 [220], CC = R*1.442

CL = Camera Length = CC/0.037


Philips 410 - Camera Magnification Calibration
Setting 18,000
07/94 to 06/05
Magnification
19500.00
19000.00
18500.00
18000.00
17500.00
17000.00
16500.00
16000.00
07/19/94
12/02/94
03/23/95
06/14/95
11/09/95
02/28/96
05/28/96
08/15/96
01/16/97
08/21/97
12/19/97
07/07/98
07/16/99
12/17/99
12/21/00
03/06/01
06/05/01
09/13/01
12/11/01
03/01/02
06/12/02
10/15/02
01/13/03
04/02/03
07/03/03
10/06/03
01/02/04
04/01/04
07/07/04
10/25/04
01/01/05
04/14/05
Camera Mag.
Upper 5%
Lower 5%
Historical CamMag
Upper 2s
Lower 2s


Philips 410 - Camera Magnification Calibration
Setting 10,000
07/94 to 06/05
Magnification
11000.00
10800.00
10600.00
10400.00
10200.00
10000.00
9800.00
9600.00
9400.00
9200.00
07/19/94
12/02/94
03/23/95
06/14/95
11/09/95
03/14/96
06/28/96
09/16/96
03/28/97
09/23/97
12/29/97
11/28/98
08/19/99
10/16/00
01/10/01
04/04/01
07/17/01
10/04/01
01/03/02
04/16/02
07/05/02
11/05/02
02/16/03
05/02/03
08/05/03
11/04/03
02/02/04
05/03/04
08/03/04
11/09/04
02/09/05
05/04/05
Calibration Date
Camera Mag.
Upper 5%
Lower 5%
Historical CamMag
Upper 2s
Lower 2s


Philips 410 - Camera Magnification Calibration
Setting 550
07/94 to 06/05
Magnification
620.00
600.00
580.00
560.00
540.00
520.00
500.00
480.00
07/19/94
01/19/95
04/28/95
10/18/95
02/28/96
05/28/96
09/16/96
03/28/97
09/23/97
12/29/97
07/16/99
12/17/99
12/21/00
03/06/01
06/05/01
09/13/01
12/11/01
03/01/02
06/12/02
10/15/02
01/13/03
04/02/03
07/03/03
10/06/03
01/02/04
04/01/04
07/07/04
10/25/04
01/01/05
04/14/05
Calibration Date
Camera Mag.
Upper 5%
Lower 5%
Historical CamMag
Upper 2s
Lower 2s


Camera Length - Philips 410 (100KV)
January 1998 - May 2005
Camera Length (mm)
740.00
735.00
730.00
725.00
720.00
715.00
710.00
705.00
700.00
695.00
690.00
01/29/98
04/29/98
07/07/98
10/04/98
01/21/99
04/21/99
07/16/99
10/17/99
01/17/00
04/17/00
07/17/00
06/05/01
09/13/01
12/07/01
03/01/02
06/02/02
10/15/02
01/13/03
04/03/03
07/03/03
10/08/03
12/03/03
12/21/03
02/02/04
03/23/04
05/10/04
05/19/04
06/14/04
08/03/04
11/16/04
02/09/05
05/04/05
Date
Camera Length
Upper 2s
Lower 2s
Avg CamLength

Screen and Camera Magnification Calibration

Date of Measurement: 6/6/2005 **Analyst:** dw

Average:

Screen Magnification at 18,000:	17383.18
Screen Magnification at 10,000:	9760.93

Camera Magnification at 18,000:	17906.40
Camera Magnification at 10,000:	10319.40
Camera Magnification at 550:	548.39

Setting 18,000

Camera

Date	Negative #	D_1	D_2	D	# Spaces	Magnification
6/6/2005	5910	38.55	121.45	82.90	10.00	17906.40

Screen

Date	# Spaces	Magnification
6/6/2005	19.26	17383.18

Setting 10,000

Camera

Date	Negative #	D_1	D_2	D	# Spaces	Magnification
6/6/2005	5911	35.15	130.70	95.55	20.00	10319.40

Screen

Date	# Spaces	Magnification
6/6/2005	34.30	9760.93

Setting 550

Camera

Date	Negative #	D_1	D_2	D	# Spaces	Magnification
6/6/2005	5912	64.70	90.85	26.15	103.00	548.39

D1 = The smaller measurement of the Supper Device in mm.

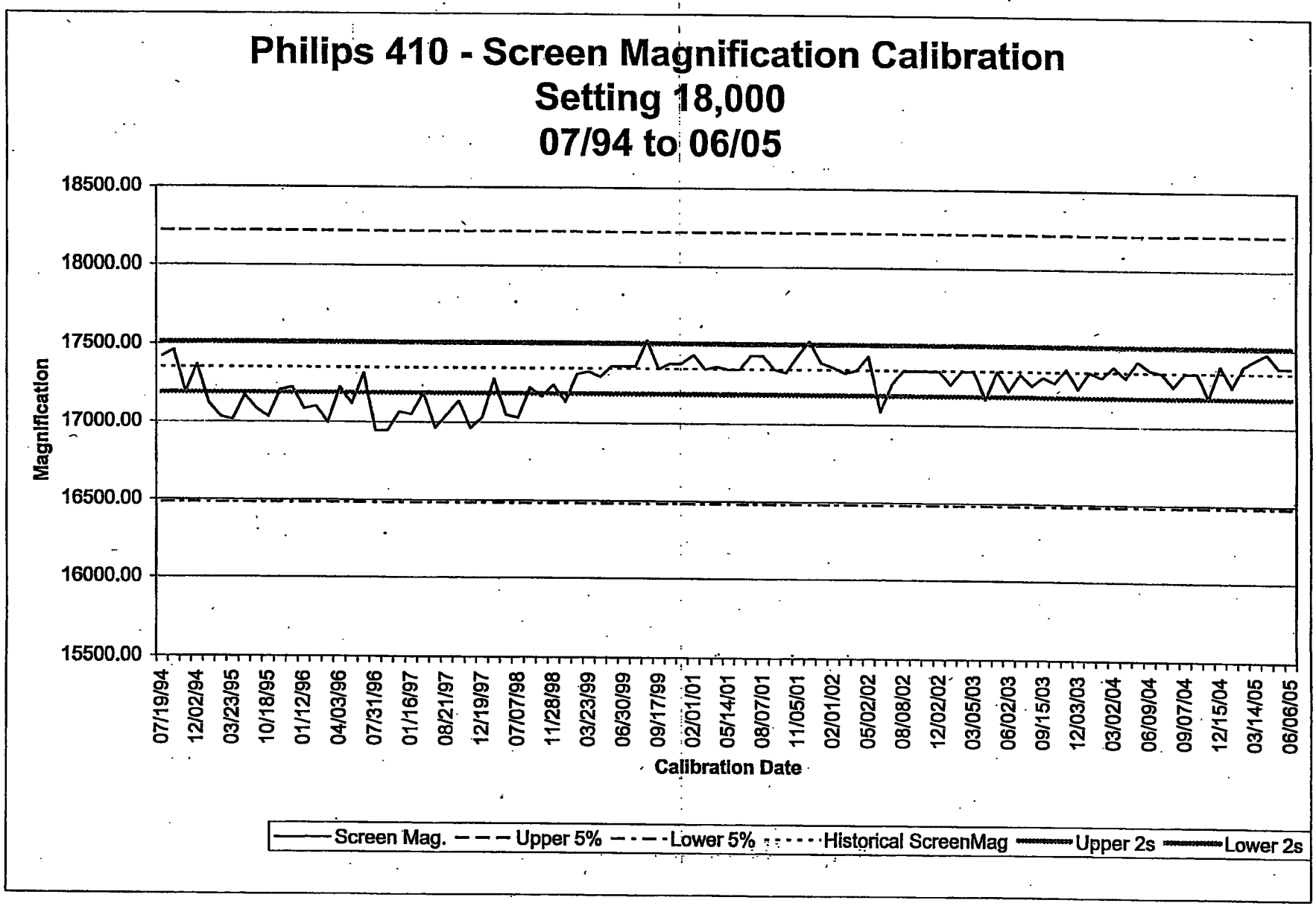
D2 = The larger measurement of the Supper Device in mm.

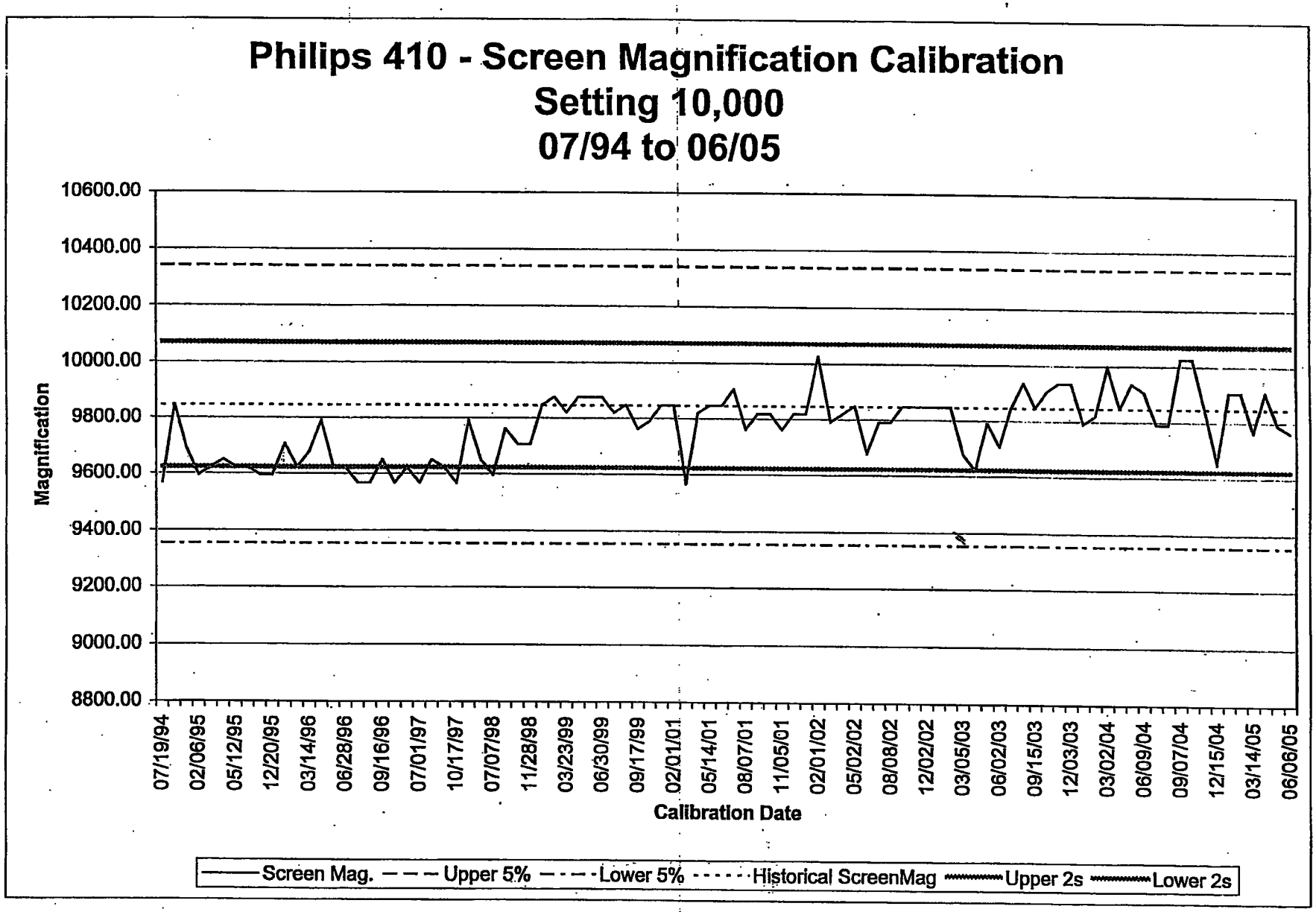
D = D2 - D1

Spaces = The number of spaces spanned by the measurement or reported on calibration sheet. For the 18,000x screen mag., take the avg. of the five measurements recorded on the monthly calibration log. For the 10,000x screen mag., only one measurement is recorded on the monthly calibration log.

Camera Magnification = (D/# spaces) * 2160

Screen Magnification = (155/# spaces) * 2160


Philips 410 - Screen Magnification Calibration
Setting 18,000
07/94 to 06/05
18500.00
18000.00
17500.00
17000.00
16500.00
16000.00
15500.00
Magnification
07/19/94
12/02/94
03/23/95
10/18/95
01/12/96
04/03/96
07/31/96
01/16/97
08/21/97
12/19/97
07/07/98
11/28/98
03/23/99
06/30/99
09/17/99
02/01/01
05/14/01
08/07/01
11/05/01
02/01/02
05/02/02
08/08/02
12/02/02
03/05/03
06/02/03
09/15/03
12/03/03
03/02/04
06/09/04
09/07/04
12/15/04
03/14/05
06/06/05
Calibration Date
Screen Mag.
Upper 5%
Lower 5%
Historical ScreenMag
Upper 2s
Lower 2s


Philips 410 - Screen Magnification Calibration
Setting 10,000
07/94 to 06/05
Magnification
10600.00
10400.00
10200.00
10000.00
9800.00
9600.00
9400.00
9200.00
9000.00
8800.00
07/19/94
02/06/95
05/12/95
12/20/95
03/14/96
06/28/96
09/16/96
07/01/97
10/17/97
07/07/98
11/28/98
03/23/99
06/30/99
09/17/99
02/01/01
05/14/01
08/07/01
11/05/01
02/01/02
05/02/02
08/08/02
12/02/02
03/05/03
06/02/03
09/15/03
12/03/03
03/02/04
06/09/04
09/07/04
12/15/04
03/14/05
06/06/05
Calibration Date
Screen Mag.
Upper 5%
Lower 5%
Historical ScreenMag
Upper 2s
Lower 2s

Na Crocidolite Std. Calibration

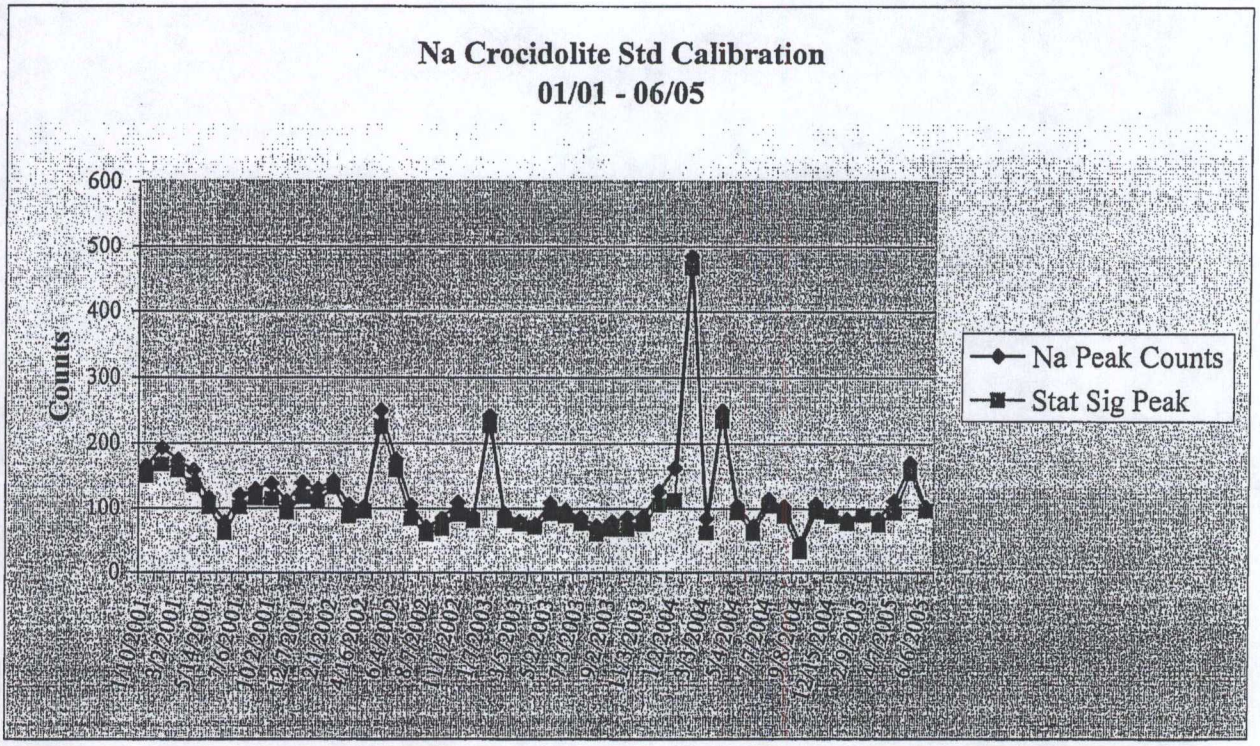
Date	Analyst	EDS #	Fiber Size >5.0um	Peak Counts**	Background Counts***	Stat. Significant Peak	Pass/Fail
1/10/2001	DW	9707	y	165	67	149.5	Pass
2/2/2001	DW	9753	y	193	71	167.5	Pass
3/2/2001	DW	9819	y	174	71	158	Pass
4/4/2001	DW	10012	y	158	56	135	Pass
5/14/2001	DW	10325	y	116	43	101	Pass
6/8/2001	DW	10405	y	78	22	61	Pass
7/6/2001	DW	10481	y	120	41	101	Pass
8/1/2001	DW	10631	y	129	50	114.5	Pass
10/2/2001	DW	10850	y	138	45	114	Pass
11/2/2001	DW	10966	y	110	38	93	Pass
12/7/2001	DW	11054	y	139	48	117.5	Pass
1/2/2002	DW	11121	y	130	45	110	Pass
2/1/2002	DW	11206	y	143	61	132.5	Pass
3/1/2002	DW	11272	y	106	34	87	Pass
4/16/2002	DW	11373	y	103	43	94.5	Pass
5/2/2002	DW	11465	y	250	100	225	Pass
6/4/2002	DW	11530	y	175	71	158.5	Pass
7/1/2002	DW	11799	y	105	31	83.5	Pass
8/7/2002	DW	12319	y	70	24	59	Pass
10/12/2002	DW	12633	y	84	26	68	Pass
11/1/2002	DW	12668	y	109	35	89.5	Pass
12/1/2002	DW	12779	y	88	37	81	Pass
1/7/2003	DW	13008	y	241	106	226.5	Pass
2/7/2003	KM	13078	y	93	34	80.5	Pass
3/5/2003	KM	13164	y	79	35	74.5	Pass
4/3/2003	KM	13225	y	75	32	69.5	Pass
5/2/2003	KM	13340	y	108	37	91	Pass
6/1/2003	KM	13436	y	97	39	87.5	Pass
7/3/2003	KM	13579	y	85	33	75.5	Pass
8/5/2003	KM	13712	y	72	23	59	Pass
9/2/2003	KM	13827	y	79	28	67.5	Pass
10/1/2003	KM	13979	y	85	25	67.5	Pass
11/3/2003	KM	14046	y	87	31	74.5	Pass
12/3/2003	KM	14130	y	126	42	105	Pass
1/2/2004	KM	14176	y	162	31	112	Pass
2/2/2004	KM	14239	y	484	224	466	Pass

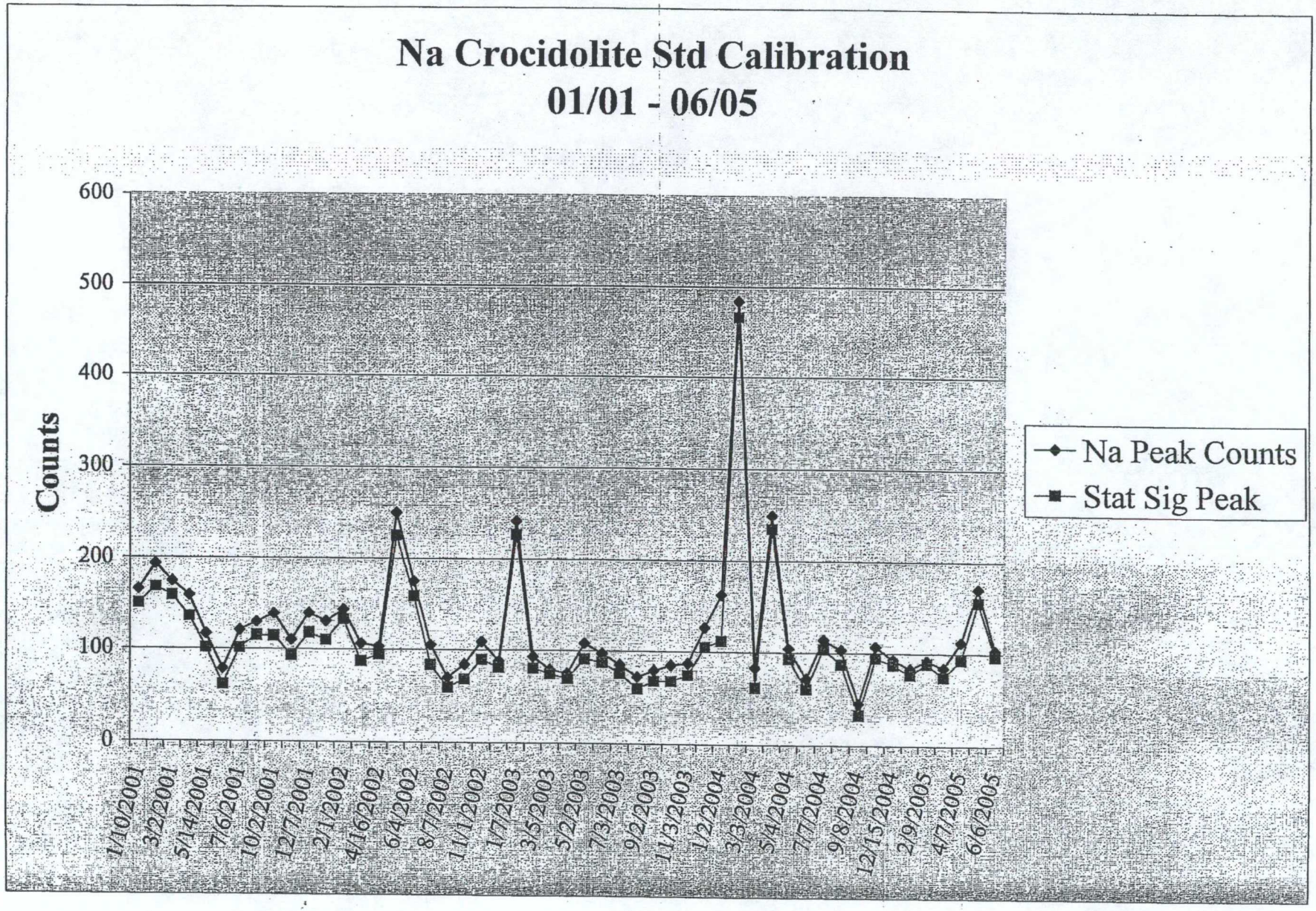
3/3/2004	KM	14284	y	83	20	61.5	Pass
4/1/2004	KM	14370	y	249	110	234.5	Pass
5/4/2004	KM	14538	y	104	41	93	Pass
6/8/2004	KM	14818	y	72	24	60	Pass
7/7/2004	DW	14868	Y	114	47	104	Pass
8/3/2004	DW	14932	Y	103	36	87.5	Pass
9/8/2004	KM	15031	Y	45	10	32.5	Pass
11/1/2004	KM	15277	Y	107	41	94.5	Pass
12/15/2004	MQ	15568	Y	93	41	87.5	Pass
1/1/2005	KM	15628	Y	83	35	76.5	Pass
2/9/2005	DW	15915	Y	92	43	89	Pass
3/18/2005	DW	15914	Y	84	32	74	Pass
4/7/2005	MQ	16007	Y	112	37	93	Pass
5/6/2005	DW	16085	Y	170	70	155	Pass
6/6/2005	DW	16178	Y	103	45	96.5	Pass

*ND - Not Done

** Peak count is the maximum Na peak count

***Background peak count is the base, right of the Na peak

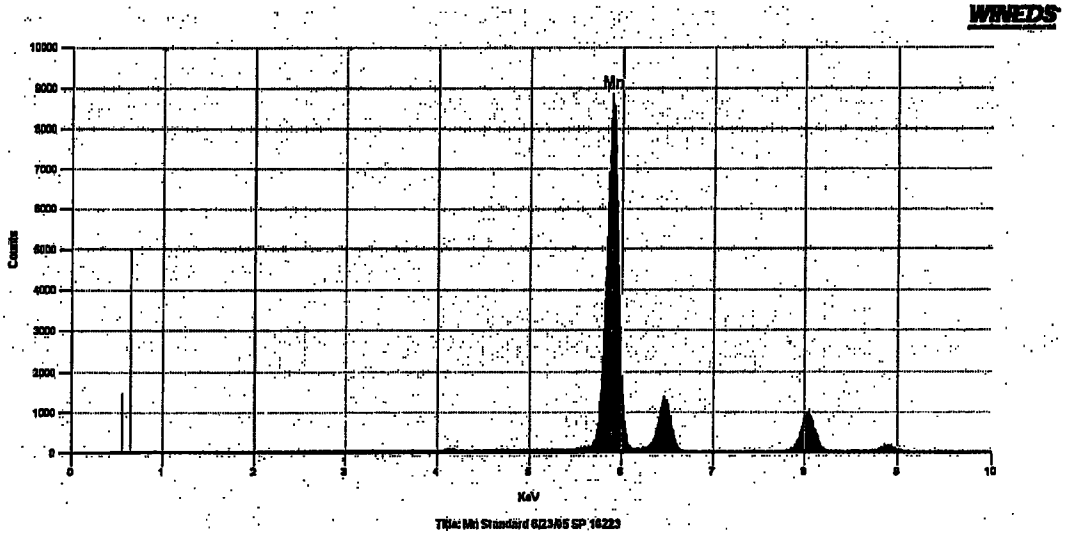


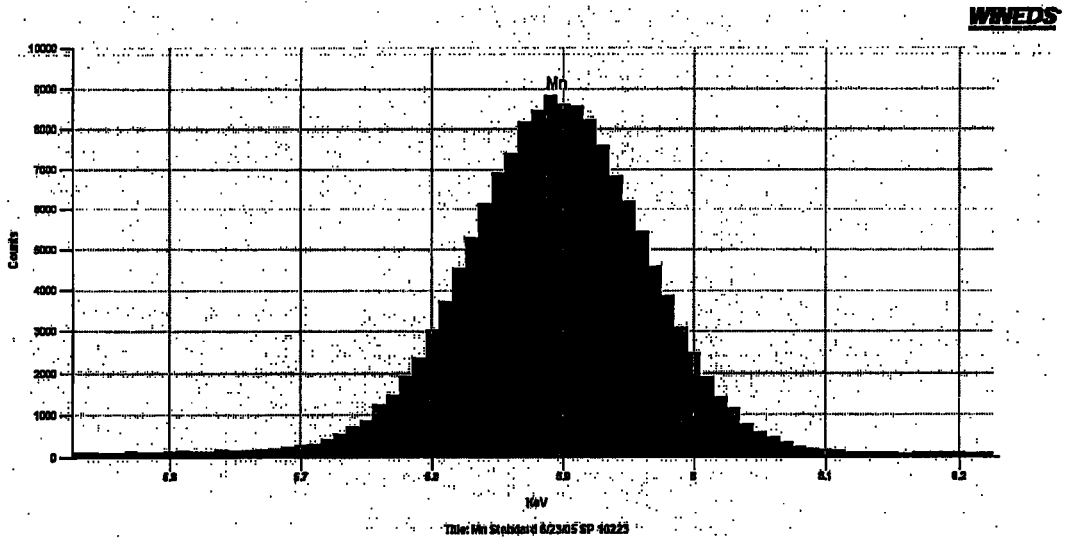

Na Crocidolite Std Calibration
01/01 - 06/05
Counts
600
500
400
300
200
100
0
1/10/2001
3/2/2001
5/14/2001
7/6/2001
10/2/2001
12/7/2001
2/1/2002
4/16/2002
6/4/2002
8/7/2002
11/1/2002
1/7/2003
3/5/2003
5/2/2003
7/3/2003
9/2/2003
11/3/2003
1/2/2004
3/3/2004
5/4/2004
7/7/2004
9/8/2004
12/15/2004
2/9/2005
4/7/2005
6/6/2005
Na Peak Counts
Stat Sig Peak

Lab/Cor, Inc.

A Professional Service Corporation in the Northwest

Mn Monthly Std
EDS#[16223]
[6-23-05] iTEM Image





Peak Statistics : EDS 16223

Peak	Energy	Height	FWHM	Area
1	5.896	8551	152	139241
2	6.483	1234	160	21060
3	8.038	950	169	17180

7619 6th Avenue NW, Seattle, WA 98117

www.labcor.net Phone: (206) 781-0155 (Office) Fax: (206) 789-8424 E-mail: mail@labcor.net

PHILIPS MnKa Peak Resolution Calibration

Date	Analyst	EDS	Mn Peak (cnts)	FWHM High (cnts)*	FWHM Low (cnts)*	FWHM (cnts)*	# Channels	Resolution (eV)	Std Dev	Std Dev (2s)	Pass/Fail
2/5/02	DW		14255	7466	6369	6918	17	170			Pass
2/13/02	DW		10830	5441	4460	4951	17	170			Pass
2/26/02	DW		10070	5734	4772	5253	16	160			Pass
3/1/02	DW		10243	5177	4378	4778	15	150			Pass
3/20/02	DW		7684	3964	3290	3627	16	160			Pass
4/16/02	DW		10042	5693	4729	5211	16	160			Pass
5/2/02	DW	11466	10022	5310	4438	4874	17	170			Pass
6/4/02	DW	11531	10252	5421	4480	4951	16	160			Pass
7/1/02	DW	11800	10300	5749	4799	5274	16	160			Pass
8/7/02	DW	12318	10640	5905	4825	5365	17	170			Pass
10/1/02	DW	12634	15662	8414	7183	7799	17	170			Pass
11/1/02	DW	12667	20000	10797	9338	10068	17	170			Pass
12/2/02	DW	12778	10303	5421	4410	4916	16	160			Pass
1/7/03	DW	13007	10303	5569	4559	5064	14	140			Pass
2/7/03	KM	13089	10427	5960	4156	5058	17	170			Pass
3/5/2003	KM	13165	2348	1046	1279	1163	17	170			Pass
4/3/2003	KM	13226	10313	5676	4731	5204	16	160			Pass
5/5/2003	KM	13341	11454	5815	4977	5396	17	170			Pass
6/1/2003	KM	13437	9806	5385	4577	4981	17	170			Pass
7/3/2003	KM	13580	10335	5440	4620	5030	17	170			Pass
8/5/2003	KM	13713	10233	5686	4710	5198	17	170			Pass
9/2/2003	KM	13828	12311	6552	5661	6107	17	170			Pass
10/1/2003	KM	13981	10934	6341	5440	5891	17	170			Pass
11/3/2003	KM	14047	12783	7599	6376	6988	17	170	3.162	6.325	Pass
12/3/2003	KM	14131	10314	5258	4476	4867	17	170	3.162	6.325	Pass
1/2/2004	KM	14175	9901	5102	4166	4634	17	170	3.162	6.325	Pass
2/2/2004	KM	14240	10370	4747	5732	5240	17	170	0.000	0.000	Pass
3/3/2004	KM	14285	10232	5374	4428	4901	16	160	3.162	6.325	Pass
4/1/2004	KM	14371	9603	5532	4718	5125	17	170	3.162	6.325	Pass
5/4/2004	KM	14542	10344	4743	4017	4380	17	170	3.162	6.325	Pass
6/8/2004	KM	14819	10084	5420	4601	5011	17	170	3.162	6.325	Pass
7/7/2004	DW	14868	12292	5971	5843	5907	16	160	4.216	8.433	Pass
9/8/2004	KM	15032	6799	4180	3197	3689	16	160	4.830	9.661	Pass
11/1/2004	KM	15278	10251	6145	5244	5695	16	160	4.924	9.847	Pass
12/15/2004	DW	15566	10227	5288	4330	4809	17	170	4.924	9.847	Pass
1/6/2005	DW	15917	3665	1451	1768	1610	16	160	5.149	10.299	Pass
2/9/2005	KM						16	160	5.222	10.445	Pass
3/18/2005	DW	15916	10784	4630	5736	5183	16	160	5.189	10.377	Pass
4/14/2005	KM	16038	6471				15.1	151	6.135	12.270	Pass
5/5/2005	DW	16086	10321				15.3	153	6.362	12.724	Pass
6/4/2005	KM	16223	8551				15.2	152	6.918	13.836	Pass

* Data is historical for the most recent 12 months												
(cnts)*	These counts are no longer necessary as the WinEDS program calculates the FWHM automatically.											

PHILLIPS
MAY 2005

Screen and Camera Magnification Calibration

Date of Measurement: 5/4/2005 **Analyst:** MQ

Average:

Screen Magnification at 18,000:	17383.18
Screen Magnification at 10,000:	9789.47

Camera Magnification at 18,000:	17543.52
Camera Magnification at 10,000:	9990.57
Camera Magnification at 550:	548.39

Setting 18,000

Camera

Date	Negative #	D_1	D_2	D	# Spaces	Magnification
5/4/2005	5901	33.90	115.12	81.22	10.00	17543.52

Screen

Date	# Spaces	Magnification
5/4/2005	19.26	17383.18

Setting 10,000

Camera

Date	Negative #	D_1	D_2	D	# Spaces	Magnification
5/4/2005	5902	34.90	122.78	87.88	19.00	9990.57

Screen

Date	# Spaces	Magnification
5/4/2005	34.20	9789.47

Setting 550

Camera

Date	Negative #	D_1	D_2	D	# Spaces	Magnification
5/4/2005	5903	64.70	90.85	26.15	103.00	548.39

D1 = The smaller measurement of the Supper Device in mm.

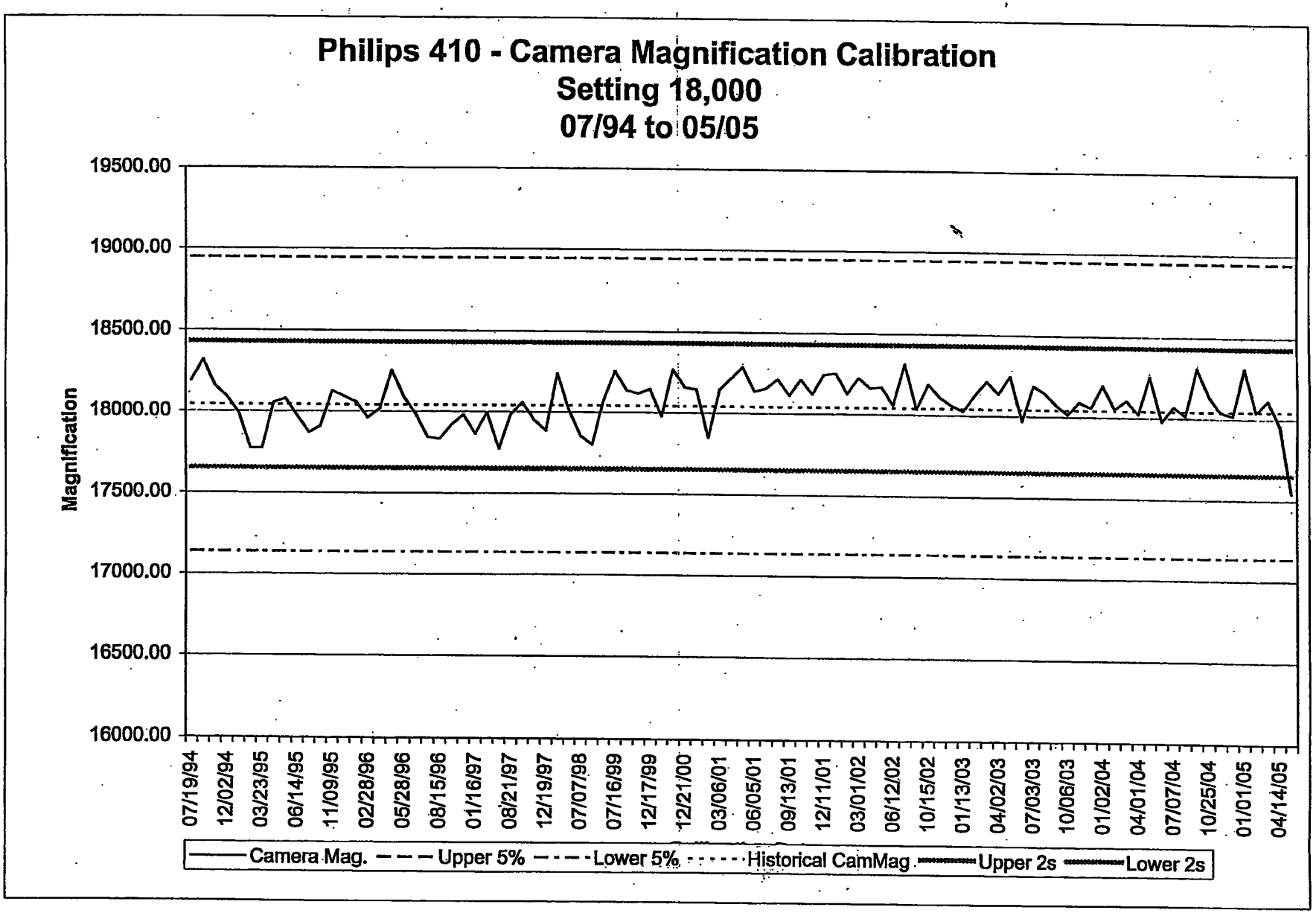
D2 = The larger measurement of the Supper Device in mm.

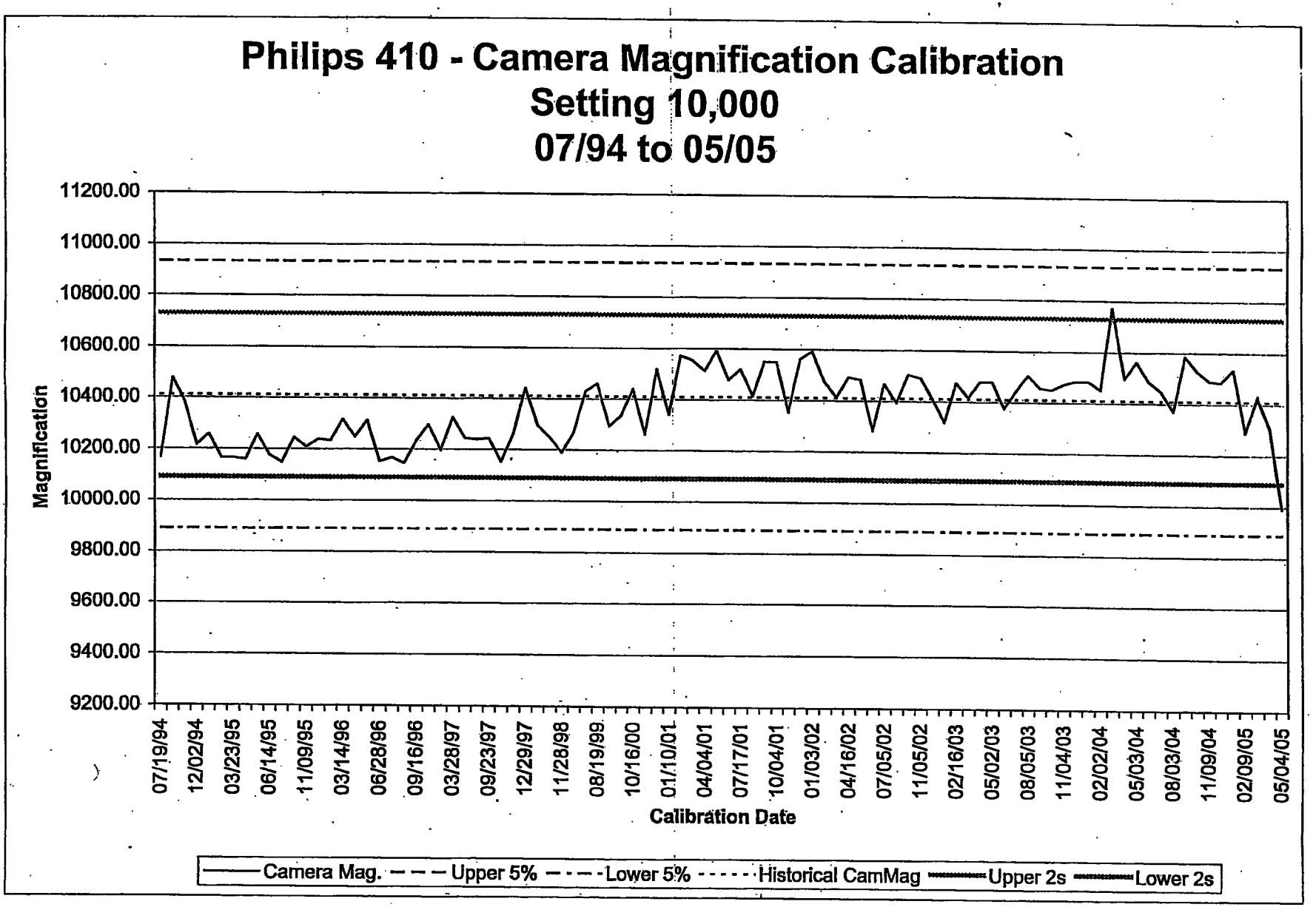
D = D2 - D1

Spaces = The number of spaces spanned by the measurement or reported on calibration sheet. For the 18,000x screen mag., take the avg. of the five measurements recorded on the monthly calibration log. For the 10,000x screen mag., only one measurement is recorded on the monthly calibration log.

Camera Magnification = (D/# spaces) * 2160

Screen Magnification = (155/# spaces) * 2160


Philips 410 - Camera Magnification Calibration
Setting 18,000
07/94 to 05/05
Magnification
19500.00
19000.00
18500.00
18000.00
17500.00
17000.00
16500.00
16000.00
07/19/94
12/02/94
03/23/95
06/14/95
11/09/95
02/28/96
05/28/96
08/15/96
01/16/97
08/21/97
12/19/97
07/07/98
07/16/99
12/17/99
12/21/00
03/06/01
06/05/01
09/13/01
12/11/01
03/01/02
06/12/02
10/15/02
01/13/03
04/02/03
07/03/03
10/06/03
01/02/04
04/01/04
07/07/04
10/25/04
01/01/05
04/14/05
Camera Mag.
Upper 5%
Lower 5%
Historical CamMag
Upper 2s
Lower 2s


Philips 410 - Camera Magnification Calibration
Setting 10,000
07/94 to 05/05
Magnification
11200.00
11000.00
10800.00
10600.00
10400.00
10200.00
10000.00
9800.00
9600.00
9400.00
9200.00
07/19/94
12/02/94
03/23/95
06/14/95
11/09/95
03/14/96
06/28/96
09/16/96
03/28/97
09/23/97
12/29/97
11/28/98
08/19/99
10/16/00
01/10/01
04/04/01
07/17/01
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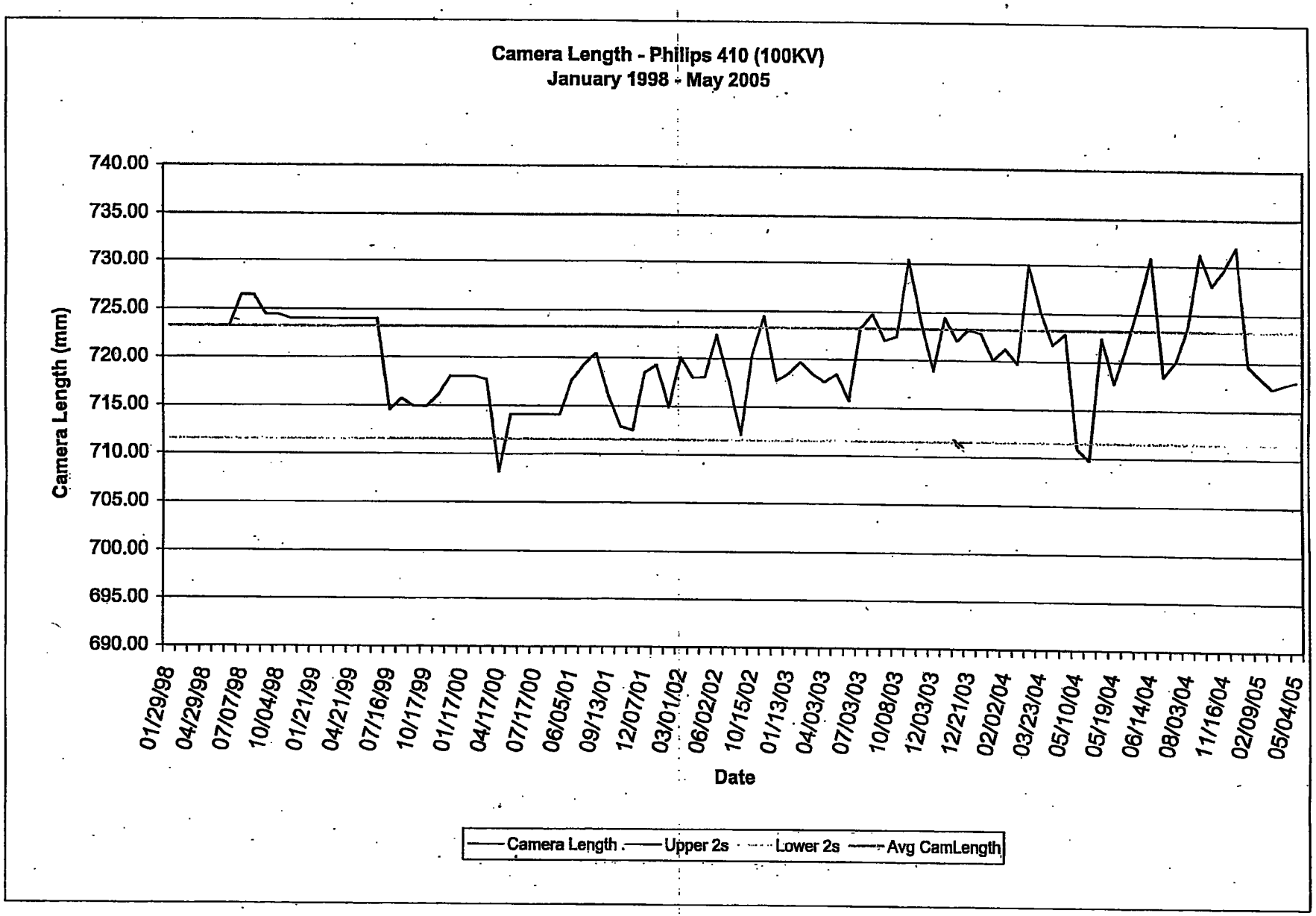
01/03/02
04/16/02
07/05/02
11/05/02
02/16/03
05/02/03
08/05/03
11/04/03
02/02/04
05/03/04
08/03/04
11/09/04
02/09/05
05/04/05
Calibration Date
Camera Mag.
Upper 5%
Lower 5%
Historical CamMag
Upper 2s
Lower 2s


Camera Length - Philips 410 (100KV)
January 1998 - May 2005
Camera Length (mm)
740.00
735.00
730.00
725.00
720.00
715.00
710.00
705.00
700.00
695.00
690.00
01/29/98
04/29/98
07/07/98
10/04/98
01/21/99
04/21/99
07/16/99
10/17/99
01/17/00
04/17/00
07/17/00
06/05/01
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06/02/02
10/15/02
01/13/03
04/03/03
07/03/03
10/08/03
12/03/03
12/21/03
02/02/04
03/23/04
05/10/04
05/19/04
06/14/04
08/03/04
11/16/04
02/09/05
05/04/05
Date
Camera Length
Upper 2s
Lower 2s
Avg CamLength

Screen Magnification Calibration (Philips 410)

(Version#1)

Date of Measurement: 5/4/2005

Analyst: MH

Average:

Screen Magnification at 18,000:	17383
Screen Magnification at 10,000:	9789

Setting 18,000

Screen

Date	# Spaces	Magnification
5/4/2005	19.26	17383

Large Circle Diameter

Date	Actual Diameter (um)	Theoretical Dia. (um)
5/4/2005	5.25	5.07

Small Circle Diameter

Date	Actual Diameter (um)	Theoretical Dia. (um)
5/4/2005	0.53	0.51

Rule

Date	Actual Length (um)	Theoretical Length (um)	Single Unit (um)	Ten Units (um)
5/4/2005	4.60	4.44	0.058	0.575

Setting 10,000

Screen

Date	# Spaces	Magnification
5/4/2005	34.2	9789

Large Circle Diameter

Date	Actual Diameter (um)	Theoretical Dia. (um)
5/4/2005	9.33	9.13

Small Circle Diameter

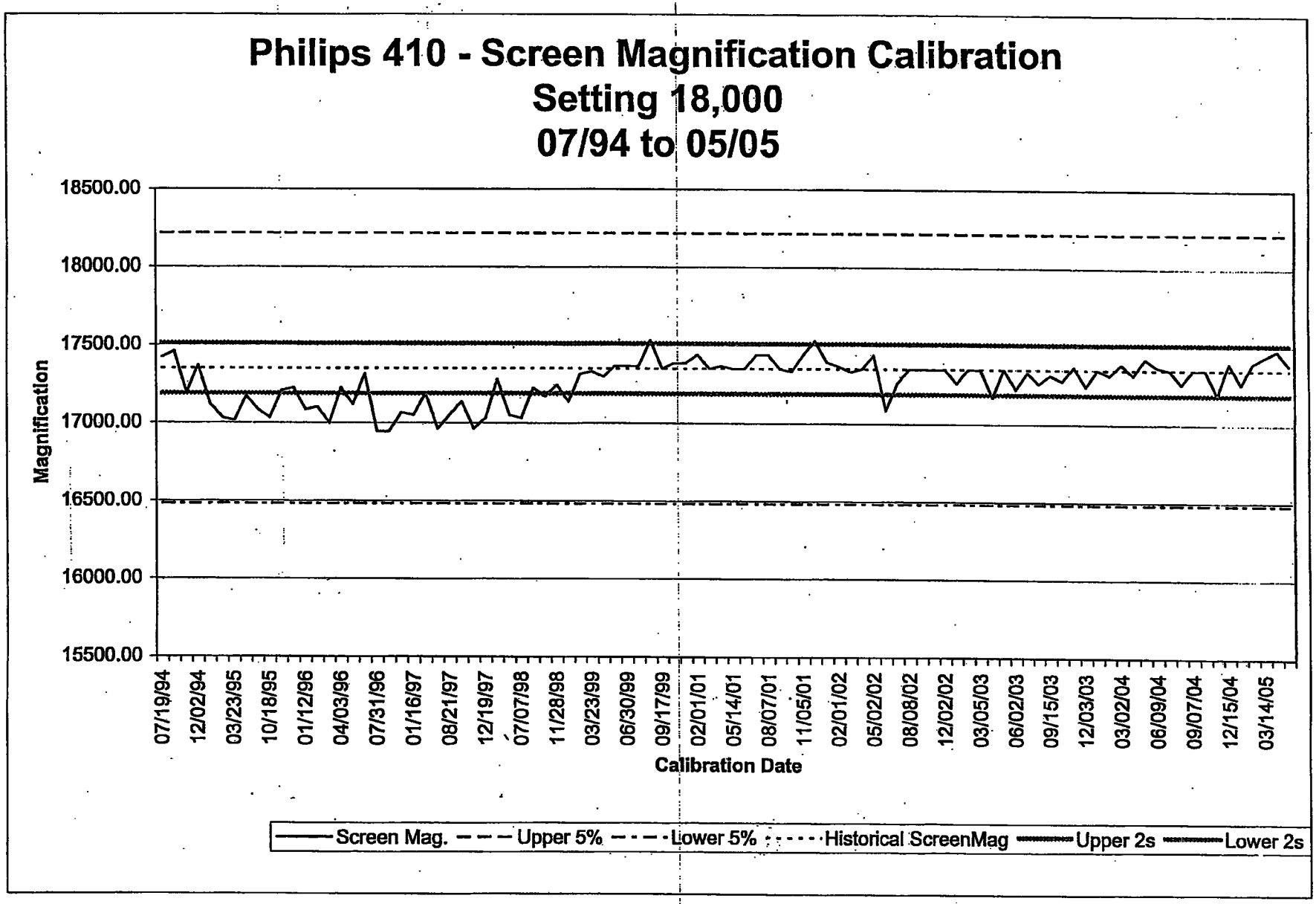
Date	Actual Diameter (um)	Theoretical Dia. (um)
5/4/2005	0.93	0.913

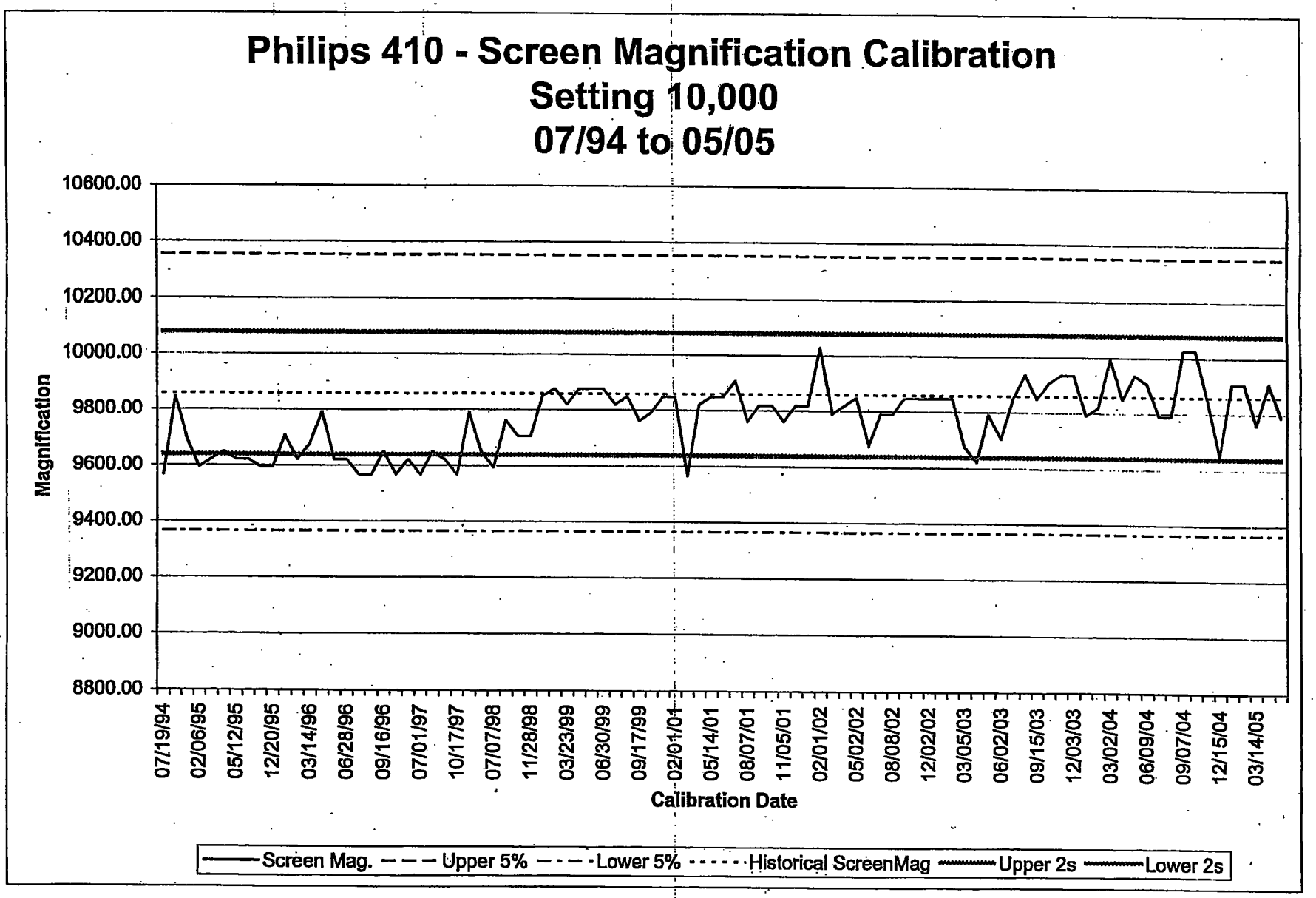
Rule

Date	Actual Length (um)	Theoretical Length (um)	Single Unit (um)	Ten Units (um)
5/4/2005	8.17	8.00	0.102	1.022

Spaces = The number of spaces spanned by the measurement or reported on calibration sheet. For the 18,000x screen mag., take the avg. of the five measurements recorded on the monthly calibration log. For the 10,000x screen mag., only one measurement is recorded on the monthly calibration log.

Screen Magnification = (155/# spaces) * 2160


Philips 410 - Screen Magnification Calibration
Setting 18,000
07/94 to 05/05
Magnification
18500.00
18000.00
17500.00
17000.00
16500.00
16000.00
15500.00
07/19/94
12/02/94
03/23/95
10/18/95
01/12/96
04/03/96
07/31/96
01/16/97
08/21/97
12/19/97
07/07/98
11/28/98
03/23/99
06/30/99
09/17/99
02/01/01
05/14/01
08/07/01
11/05/01
02/01/02
05/02/02
08/08/02
12/02/02
03/05/03
06/02/03
09/15/03
12/03/03
03/02/04
06/09/04
09/07/04
12/15/04
03/14/05
Calibration Date
Screen Mag.
Upper 5%
Lower 5%
Historical ScreenMag
Upper 2s
Lower 2s


Philips 410 - Screen Magnification Calibration
Setting 10,000
07/94 to 05/05
Magnification
10600.00
10400.00
10200.00
10000.00
9800.00
9600.00
9400.00
9200.00
9000.00
8800.00
07/19/94
02/06/95
05/12/95
12/20/95
03/14/96
06/28/96
09/16/96
07/01/97
10/17/97
07/07/98
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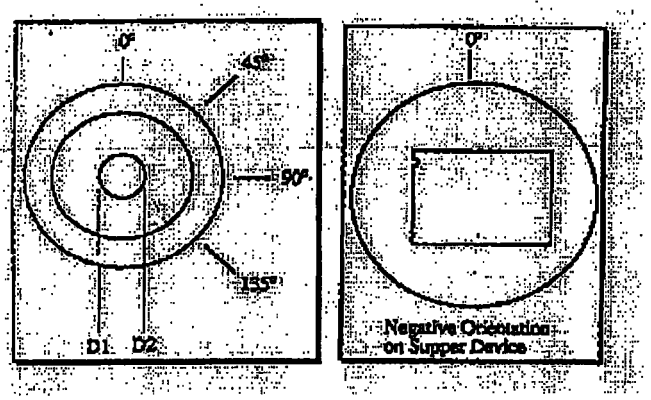
03/05/03
06/02/03
09/15/03
12/03/03
03/02/04
06/09/04
09/07/04
12/15/04
03/14/05
Calibration Date
Screen Mag.
Upper 5%
Lower 5%
Historical ScreenMag
Upper 2s
Lower 2s

Camera Length and Camera Constant Calibration (Version#1)

Date of Measurement:	6/8/2005	Average Camera Constant:	26.6 mmA
Negative Number:	5903	(All 12 Measurements)	
Date Negative was Taken:	5/5/2005	Average Camera Length:	718.93 mm
Analyst:	MH	(All 12 Measurements)	

Ring #	0 degrees						45 degrees					
	D_1	D_2	D	R	CC	CL	D_1	D_2	D	R	CC	CL
1	74.10	96.45	22.35	11.18	26.32	711.27	80.15	102.60	22.45	11.23	26.43	714.46
2	72.50	98.35	25.85	12.93	26.35	712.27	78.30	104.30	26.00	13.00	26.51	716.41
3	67.00	103.55	36.55	18.28	26.35	712.23	72.85	109.65	36.80	18.40	26.53	717.10

Ring #	90 degrees						135 degrees					
	D_1	D_2	D	R	CC	CL	D_1	D_2	D	R	CC	CL
1	80.25	103.10	22.85	11.43	26.91	727.19	74.85	97.45	22.60	11.30	26.61	719.23
2	78.55	104.90	26.35	13.18	26.86	726.05	73.00	99.10	26.10	13.05	26.61	719.16
3	72.90	110.30	37.40	18.70	26.97	728.79	67.50	104.60	37.10	18.55	26.75	722.95



Measure the first three rings moving outward from the central spot of the diffraction pattern.

D_1 = The smaller measurement on the Supper device (mm).

D_2 = The larger measurement on the Supper device (mm).

$D = D_2 - D_1$

$R = D/2$

CC = Camera Constant

For Ring 1 [111], CC = R*2.355
For Ring 2 [200], CC = R*2.039
For Ring 3 [220], CC = R*1.442

CL = Camera Length = CC/0.037

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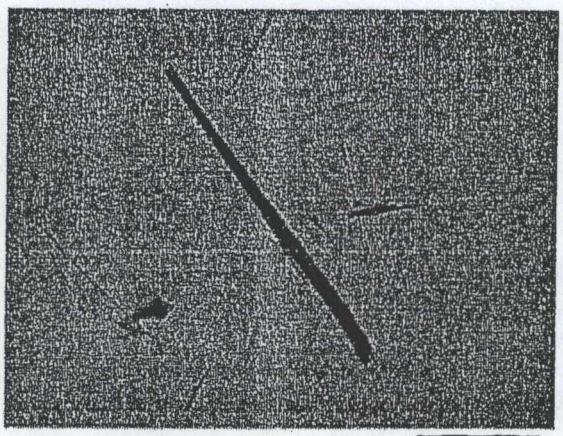
Na Crocidolite Std

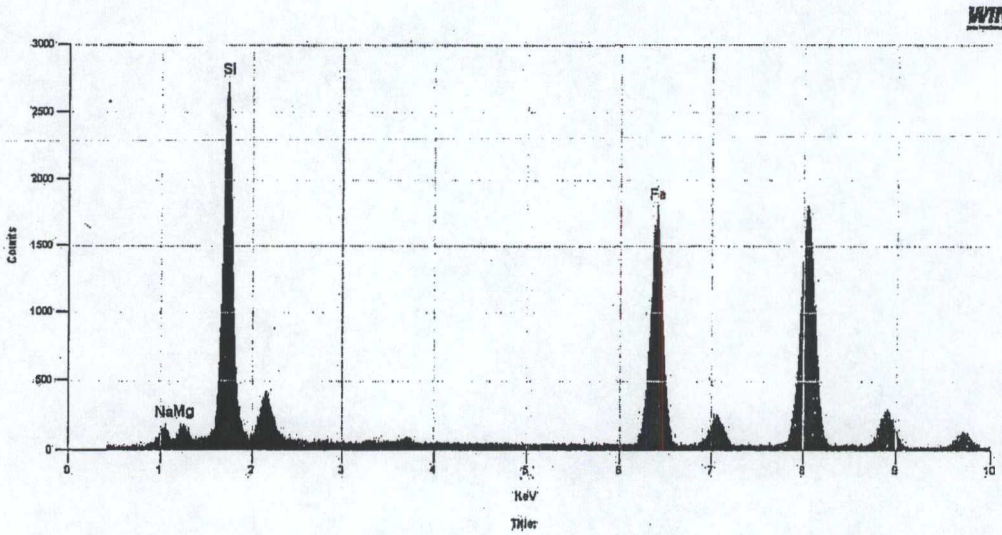
Neg#[P370]
[5-6-05] iTEM Image

Phillips



3580 : 1

5µm



Quantitative Analysis Results - Standardless Analysis :
Na Crocidolite Std EDS#16085 Fri, May 06 2005
EDS Parameters - 100KV, Takeoff Angle: 38.0°, Fit Index: 11.02

Element	Atoms%	Compound	Weight%	Error(±)	Norm%
Na	3.26	Na2O	4.35	0.39	4.35
Mg	1.76	MgO	3.05	0.25	3.05
Si	21.57	SiO2	55.71	0.74	55.71
Fe	10.75	Fe2O3	36.89	0.71	36.89
<Total>	100.00		100.00		100.00

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Na Crocidolite Std. Calibration

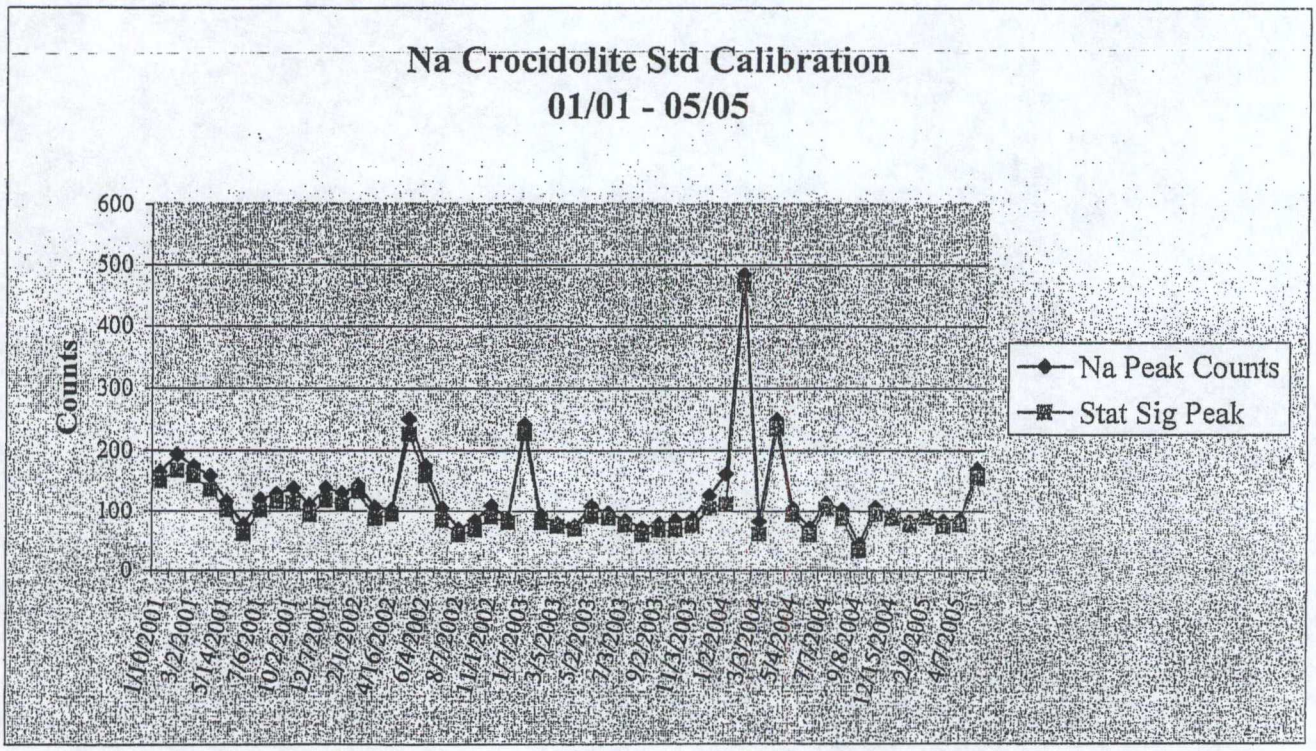
Date	Analyst	EDS #	Fiber Size >5.0um	Peak Counts**	Background Counts***	Stat. Significant Peak	Pass/Fail
1/10/2001	DW	9707	y	165	67	149.5	Pass
2/2/2001	DW	9753	y	193	71	167.5	Pass
3/2/2001	DW	9819	y	174	71	158	Pass
4/4/2001	DW	10012	y	158	56	135	Pass
5/14/2001	DW	10325	y	116	43	101	Pass
6/8/2001	DW	10405	y	78	22	61	Pass
7/6/2001	DW	10481	y	120	41	101	Pass
8/1/2001	DW	10631	y	129	50	114.5	Pass
10/2/2001	DW	10850	y	138	45	114	Pass
11/2/2001	DW	10966	y	110	38	93	Pass
12/7/2001	DW	11054	y	139	48	117.5	Pass
1/2/2002	DW	11121	y	130	45	110	Pass
2/1/2002	DW	11206	y	143	61	132.5	Pass
3/1/2002	DW	11272	y	106	34	87	Pass
4/16/2002	DW	11373	y	103	43	94.5	Pass
5/2/2002	DW	11465	y	250	100	225	Pass
6/4/2002	DW	11530	y	175	71	158.5	Pass
7/1/2002	DW	11799	y	105	31	83.5	Pass
8/7/2002	DW	12319	y	70	24	59	Pass
10/12/2002	DW	12633	y	84	26	68	Pass
11/1/2002	DW	12668	y	109	35	89.5	Pass
12/1/2002	DW	12779	y	88	37	81	Pass
1/7/2003	DW	13008	y	241	106	226.5	Pass
2/7/2003	KM	13078	y	93	34	80.5	Pass
3/5/2003	KM	13164	y	79	35	74.5	Pass
4/3/2003	KM	13225	y	75	32	69.5	Pass
5/2/2003	KM	13340	y	108	37	91	Pass
6/1/2003	KM	13436	y	97	39	87.5	Pass
7/3/2003	KM	13579	y	85	33	75.5	Pass
8/5/2003	KM	13712	y	72	23	59	Pass
9/2/2003	KM	13827	y	79	28	67.5	Pass
10/1/2003	KM	13979	y	85	25	67.5	Pass
11/3/2003	KM	14046	y	87	31	74.5	Pass
12/3/2003	KM	14130	y	126	42	105	Pass
1/2/2004	KM	14176	y	162	31	112	Pass
2/2/2004	KM	14239	y	484	224	466	Pass

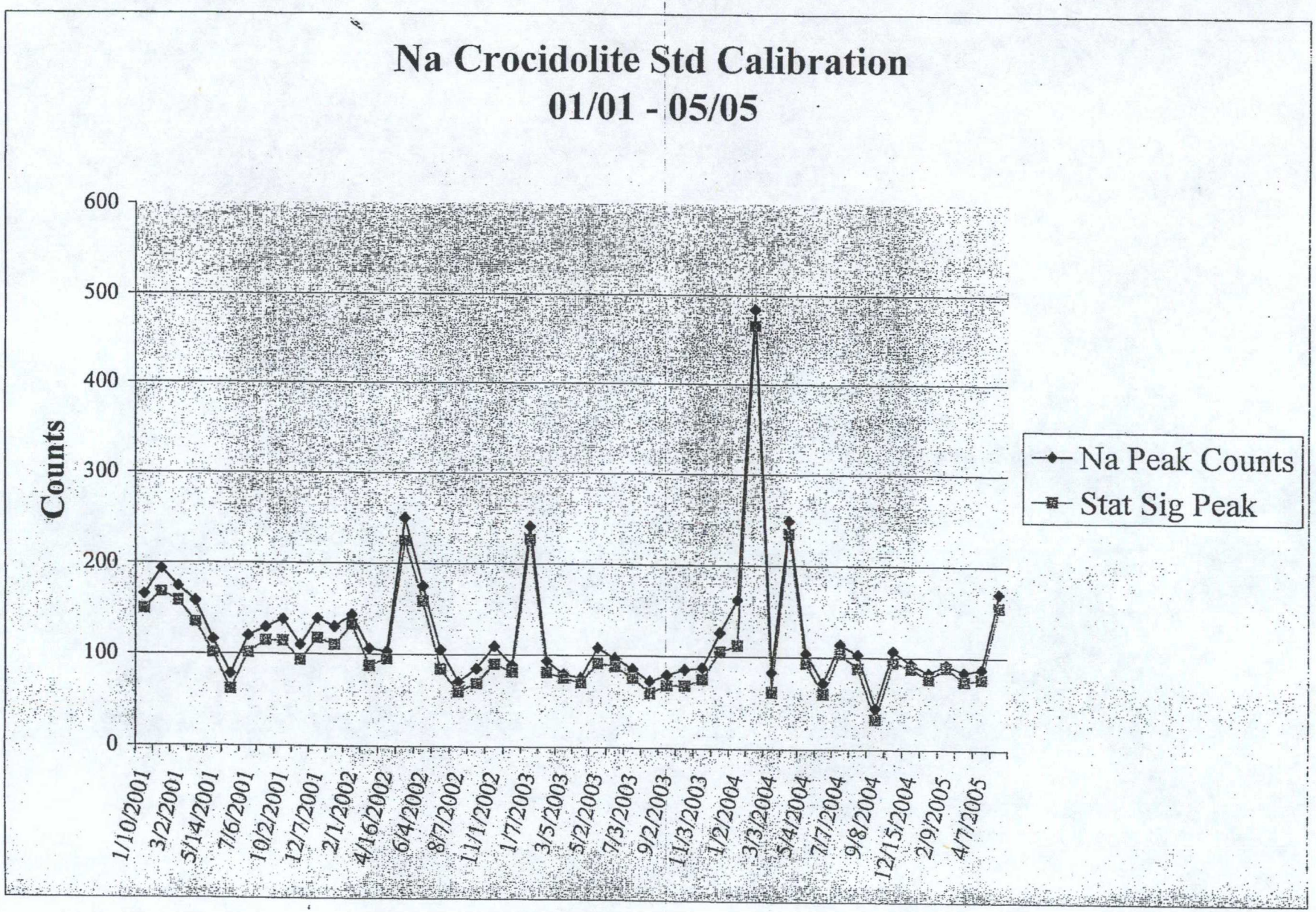
3/3/2004	KM	14284	y	83	20	61.5	Pass
4/1/2004	KM	14370	y	249	110	234.5	Pass
5/4/2004	KM	14538	y	104	41	93	Pass
6/8/2004	KM	14818	y	72	24	60	Pass
7/7/2004	DW	14868	Y	114	47	104	Pass
8/3/2004	DW	14932	Y	103	36	87.5	Pass
9/8/2004	KM	15031	Y	45	10	32.5	Pass
11/1/2004	KM	15277	Y	107	41	94.5	Pass
12/15/2004	MQ	15568	Y	93	41	87.5	Pass
1/1/2005	KM	15628	Y	83	35	76.5	Pass
2/9/2005	DW	15915	Y	92	43	89	Pass
3/18/2005	DW	15914	Y	84	32	74	Pass
4/7/2005	MQ	16007	Y	87	33	76.5	Pass
5/6/2005	DW	16085	Y	170	70	155	Pass

*ND - Not Done

** Peak count is the maximum Na peak count

***Background peak count is the base, right of the Na peak




Na Crocidolite Std Calibration
01/01 - 05/05
Counts
600
500
400
300
200
100
0
1/10/2001
3/2/2001
5/14/2001
7/6/2001
10/2/2001
12/7/2001
2/1/2002
4/16/2002
6/4/2002
8/7/2002
11/1/2002
1/7/2003
3/5/2003
5/2/2003
7/3/2003
9/2/2003
11/3/2003
1/2/2004
3/3/2004
5/4/2004
7/7/2004
9/8/2004
12/15/2004
2/9/2005
4/7/2005
Na Peak Counts
Stat Sig Peak

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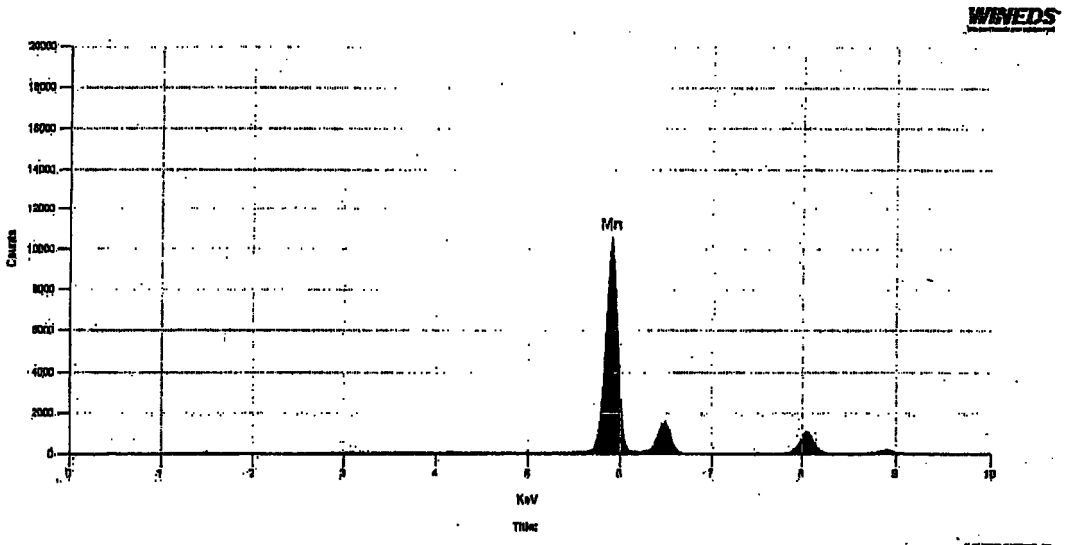
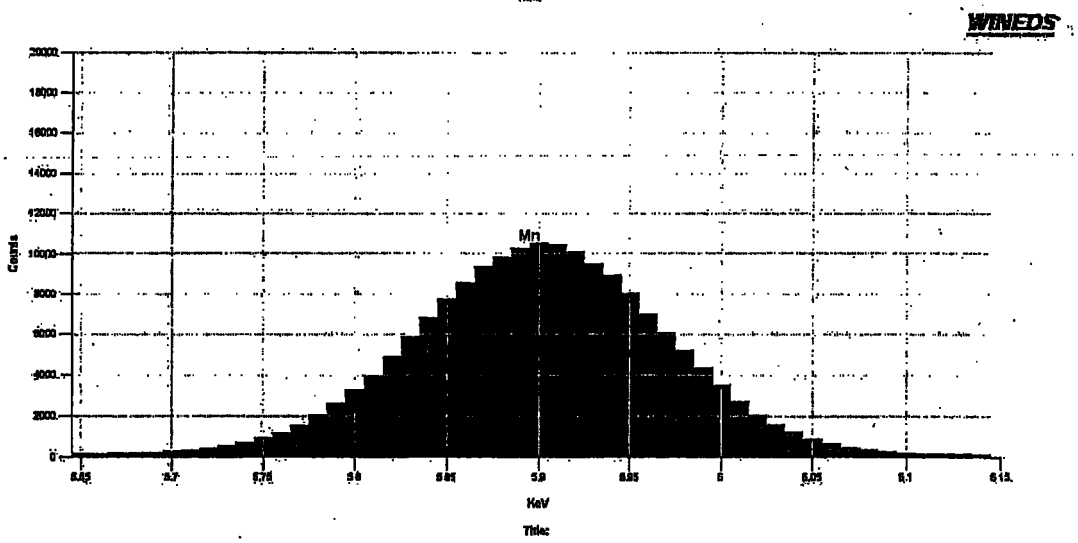
Mn Monthly Std
EDS#[16086]
[5-6-05] iTEM Image

Philips





Peak Statistics : EDS# 16086

Peak	Energy	Height	FWHM	Area
1	5.901	10321	153	168997
2	6.491	1473	161	25353
3	8.046	1053	166	18668

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BEAM DOSE CALIBRATION

Date:			5/6/2005		
Analyst:			DW	Image #	Philips
Fiber Length used in analysis:			1.2 x 0.1 um	P374	
Time (sec)	**Visual**	**Neg #**	**Recordable Diffraction**	**EDS**	
0	Y	ND*	ND*		
30	Y	ND*	ND*		
60	Y	P371	Y		
90	Y	P372	Y		
120	Y	P373	Y	16088	
PASS/FAIL	**PASS**		**PASS**		

*ND - Not Done

Visual - Mark "Y" if diffraction pattern is seen on screen, mark "N" if pattern is not seen on screen

Recordable Diffraction - Mark "Y" if diffraction pattern is seen on negative, mark "N" if pattern is not seen on negative

Chrysotile Fiber Specs.: Single fibril, >= 1.0 micron in length

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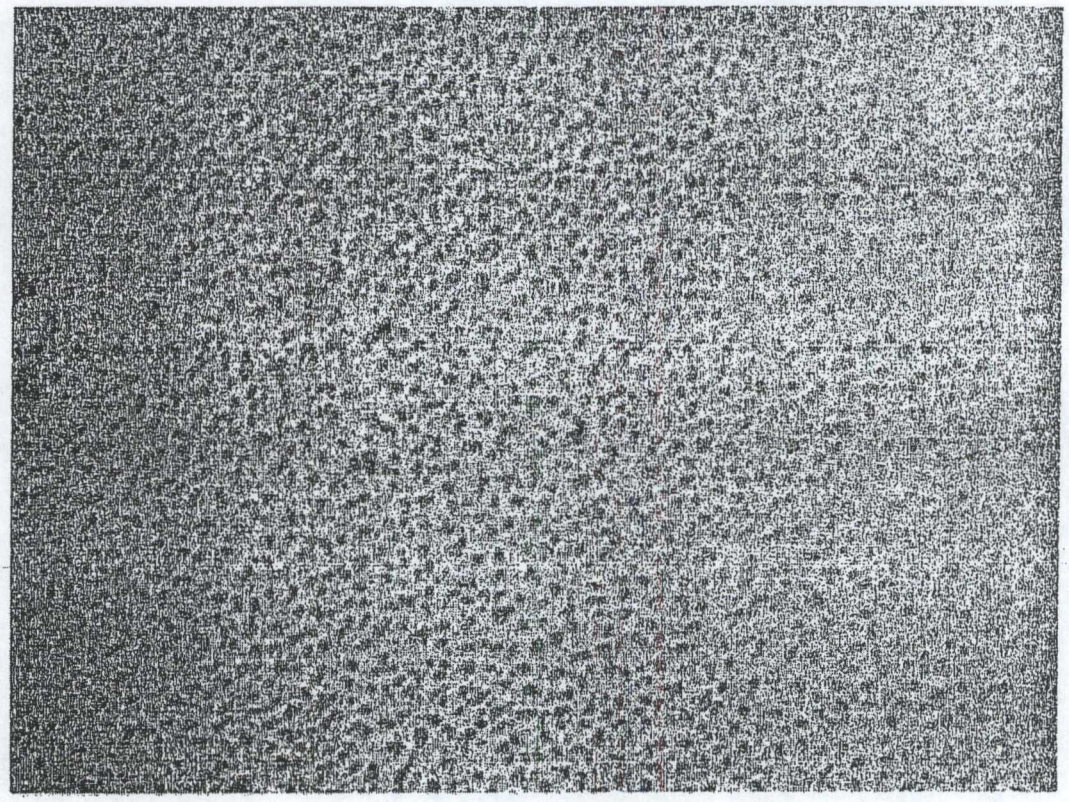
Plasma Etch Rate
L/C Batch# 050450
4 Minute Etch Rate
3/18/05



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Phone: (206) 781-0155 (Office) **Fax:** (206) 789-8424 (Fax) **E-mail:** mail@labcor.net

JEOL
JUNE 2005

Screen and Camera Magnification Calibration

Version#3

Date of Measurement: 6/13/2005 **Analyst:** MH

Setting: 20,000

Camera

Date	Negative #	D_1	D_2	D	# Spaces	Magnification
6/9/2005	1699	29.75	124.5	94.75	11	18605

	SM1	SM2	SM3	SM4	SM5
Screen	22.1	22.1	22.2	22.3	22.1

Date	# Spaces	Magnification
6/9/2005	22.16	15596

Setting: 10,000

Camera

Date	Negative #	D_1	D_2	D	# Spaces	Magnification
6/9/2005	1700	31.2	134.1	102.9	23	9664

	SM1	SM2	SM3	SM4	SM5
Screen	44.1	44.2	44.1	44.1	43.9

Date	# Spaces	Magnification
6/9/2005	44.08	7840

Setting: 5,000

Camera

Date	Negative #	D_1	D_2	D	# Spaces	Magnification
6/9/2005	1701	24.2	136.55	112.35	50	4854

1702 sample out first

Setting: 1,000

Camera

Date	Negative #	D_1	D_2	D	# Spaces	Magnification
6/9/2005	1703			0		

1704 sample in

D1 = The smaller measurement of the Supper Device in mm.

D2 = The larger measurement of the Supper Device in mm.

D = D2 - D1

Spaces = The number of spaces spanned by the measurement or reported on calibration sheet. For the 18,000x screen mag., take the avg. of the five measurements recorded on the monthly calibration log. For the 10,000x screen mag., only one measurement is recorded on the monthly calibration log.

Camera Magnification = (D/# spaces) * 2160

Screen Magnification = (155/# spaces) * 2160

Screen Magnification Calibration (Jeol 1200)

(Version#1)

Date of Measurement: 6/9/2005

Analyst: MH

Average:

Screen Magnification at 18,000:	15596
Screen Magnification at 10,000:	7840

Setting 20,000

	SM1	SM2	SM3	SM4	SM5
Screen	22.1	22.1	22	22	22.2

Date	# Spaces	Magnification
6/9/2005	22.16	15596

Rule

Date	Actual Length (um)	Theoretical Length (um)	Single Unit (um)	Ten Units (um)
6/9/2005	5.13	4.44	0.064	0.641

Setting 10,000

	SM1	SM2	SM3	SM4	SM5
Screen	43.9	44	43.9	44	43.8

Date	# Spaces	Magnification
6/9/2005	44.08	7840

Rule

Date	Actual Length (um)	Theoretical Length (um)	Single Unit (um)	Ten Units (um)
6/9/2005	10.20	8.00	0.128	1.275

Spaces = The number of spaces spanned by the measurement or reported on calibration sheet. For the 18,000x screen mag., take the avg. of the five measurements recorded on the monthly calibration log. For the 10,000x screen mag., only one measurement is recorded on the monthly calibration log.

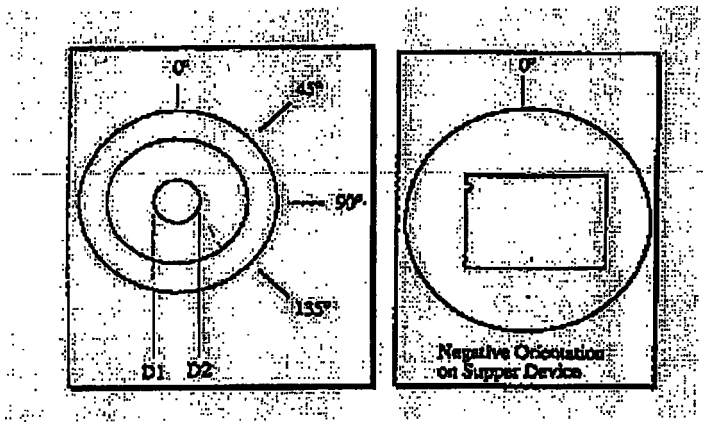
Screen Magnification = (160/# spaces) * 2160

Camera Length and Camera Constant Calibration (Version#1)

Date of Measurement:	6/11/2005	Average Camera Constant:	30.015 mmA
Negative Number:	J1692	(All 12 Measurements)	
Date Negative was Taken:	6/6/2005	Average Camera Length:	811.23 mm
Analyst:	MH	(All 12 Measurements)	

Ring #	0 degrees						45 degrees					
	D_1	D_2	D	R	CC	CL	D_1	D_2	D	R	CC	CL
1	66.95	92.60	25.65	12.83	30.20	816.29	65.40	90.80	25.40	12.70	29.91	808.34
2	65.00	94.70	29.70	14.85	30.28	818.36	63.45	92.65	29.20	14.60	29.77	804.58
3	58.85	100.80	41.95	20.98	30.25	817.46	57.35	99.00	41.65	20.83	30.03	811.61

Ring #	90 degrees						135 degrees					
	D_1	D_2	D	R	CC	CL	D_1	D_2	D	R	CC	CL
1	65.90	91.15	25.25	12.63	29.73	803.56	68.00	93.50	25.50	12.75	30.03	811.52
2	63.80	93.00	29.20	14.60	29.77	804.58	65.90	95.45	29.55	14.78	30.13	814.22
3	57.85	99.30	41.45	20.73	29.89	807.71	59.75	101.65	41.90	20.95	30.21	816.48



Measure the first three rings moving outward from the central spot of the diffraction pattern.

D_1 = The smaller measurement on the Supper device (mm).

D_2 = The larger measurement on the Supper device (mm).

$D = D_2 - D_1$

R = D/2

CC = Camera Constant

For Ring 1 [111], CC = R*2.355

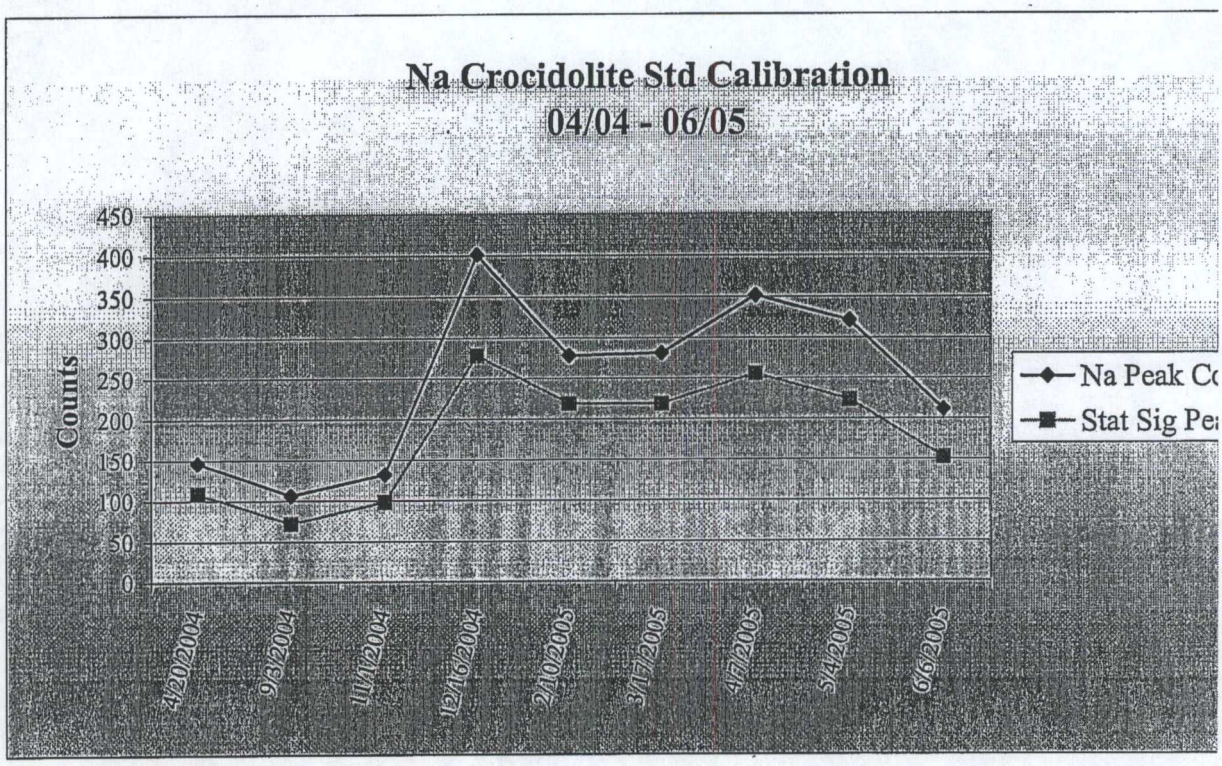
For Ring 2 [200], CC = R*2.039

For Ring 3 [220], CC = R*1.442

CL = Camera Length = CC/0.037

Na Crocidolite Std. Calibration

Date	Analyst	EDS #	Fiber Size >5.0um	Peak Counts**	Background Counts***	Stat. Significant Peak	Pass/Fail
4/20/2004	JH	90	5.0 x 0.3	146	36	109	Pass
9/3/2004	KM	484		106	19	72	Pass
11/1/2004	JH	704		132	32	98	Pass
12/16/2004	JH	863		401	78	278.5	Pass
2/10/2005	JH	1034	13 x 0.25	278	80	219	Pass
3/17/2005	KM	1164		281	78	218.5	Pass
4/7/2005	KM	1219	55 x 0.8	351	80	255.5	Pass
5/4/2005	KM	1251	35 * 0.8	321	63	223.5	Pass
6/6/2005	KM	1397	25 * 0.7	211	47	152.5	Pass



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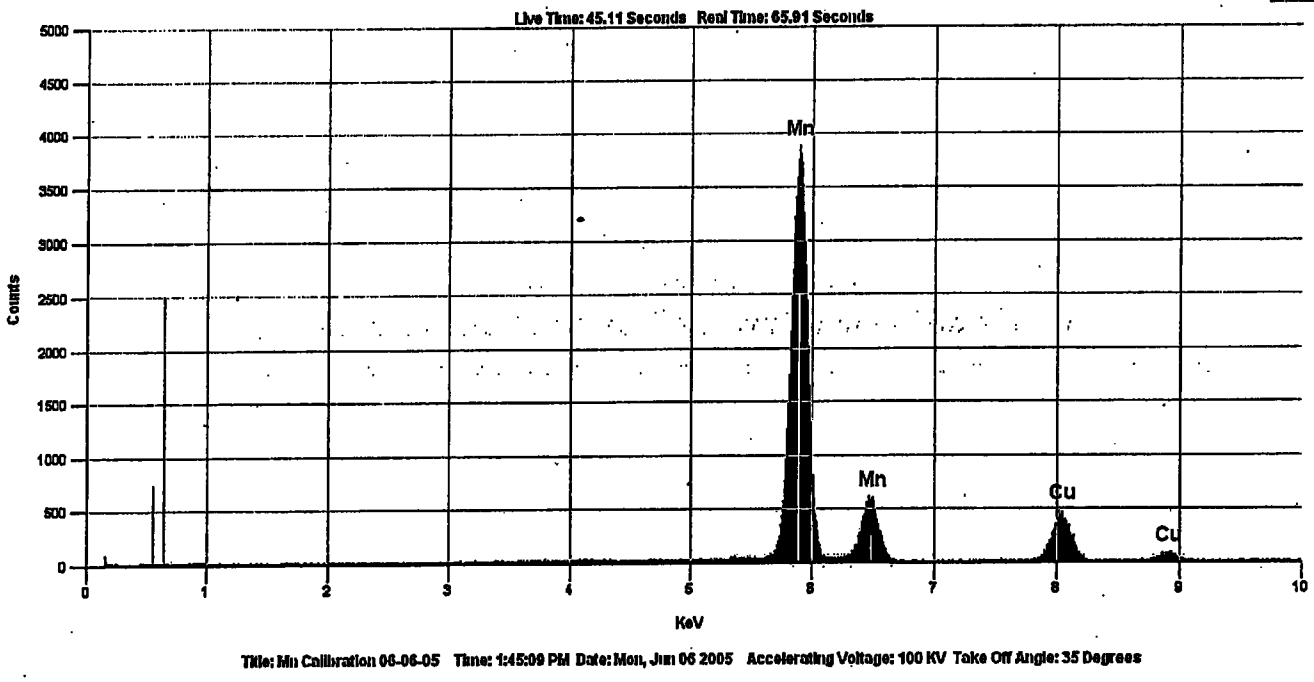
06-06-05
Jeol 1200 EX



Quantitative Analysis Results - Standardless Analysis :
Mn Calibration 06-06-05 Mon, Jun 06 2005
EDS Parameters - 100KV, Takeoff Angle: 35.0°, Fit Index: 2.74
Correction: CLIFF LORIMER, Cycles: 1

Element	Atoms%	Compound	Weight%	Error(±)	Norm%
Mn	50.00	MnO	100.00	1.15	100.00
<Total>	100.00		100.00		100.00

Peak List
Peak Statistics : Spectrum8

Peak	Energy	Height	FWHM	Area
1	5.893	3758	155	62215
2	6.481	549	161	9471
3	8.036	403	174	7487.

JEOL MnKa Peak Resolution Calibration

Date	Analyst	EDS	# Channels	Resolution (eV)	Std Dev	Std Dev (2s)	Pass/Fail	
4/5/2004	JH	11						
7/14/2004	KM	380	14	140			Pass	
9/18/2004	JH	506	13.9	139	0.707	1.4142136	Pass	
11/1/2004	JH	705	14.1	141	1.000	2	Pass	
12/16/2004	JH	864	14.1	141	0.957	1.9148542	Pass	
1/21/2005	JH	984	16.4	164	10.654	21.307276	Fail	**Service Technician called to recalibrate EDS system.
2/10/2005	JH	1035	13.9	139	9.839	19.677398	Pass	
3/17/2005	KM	1165	14.4	144	8.981	17.962925	Pass	
4/7/2005	km	1220	15.9	159	10.339	20.678952	Pass	
5/4/2005	km	1250	15.4	154	10.024	20.047562	Pass	
6/6/2005	km	1398	15.5	155	9.582	19.163457	Pass	

JEOL
MAY 2005

Screen and Camera Magnification Calibration

Version#3

Date of Measurement: 6/13/2005 **Analyst:** MH

Setting: 20,000

Camera

Date	Negative #	D_1	D_2	D	# Spaces	Magnification
5/4/2005	1618	41.15	119.55	78.4	9	18816

	SM1	SM2	SM3	SM4	SM5
Screen	22.2	22.3	22.15	22	22.2

Date	# Spaces	Magnification
5/4/2005	22.17	15589

Setting: 10,000

Camera

Date	Negative #	D_1	D_2	D	# Spaces	Magnification
5/4/2005	1619	33.05	122.25	89.2	20	9634

	SM1	SM2	SM3	SM4	SM5
Screen	43.8	44	43.9	43.8	44

Date	# Spaces	Magnification
5/4/2005	43.9	7872

Setting: 5,000

Camera

Date	Negative #	D_1	D_2	D	# Spaces	Magnification
5/4/2005	1621	34.08	130.83	96.75	44	4750

D1 = The smaller measurement of the Supper Device in mm.

D2 = The larger measurement of the Supper Device in mm.

D = D2 - D1

Spaces = The number of spaces spanned by the measurement or reported on calibration sheet. For the 18,000x screen mag., take the avg. of the five measurements recorded on the monthly calibration log. For the 10,000x screen mag., only one measurement is recorded on the monthly calibration log.

Camera Magnification = (D/# spaces) * 2160

Screen Magnification = (155/# spaces) * 2160

Screen Magnification Calibration (Jeol 1200)

(Version#1)

Date of Measurement: 5/4/2005

Analyst: MH

Average:

Screen Magnification at 18,000:	15589
Screen Magnification at 10,000:	7872

Setting 20,000

	SM1	SM2	SM3	SM4	SM5
Screen	22.1	22.1	22	22	22.2

Date	# Spaces	Magnification
5/4/2005	22.17	15589

Rule

Date	Actual Length (um)	Theoretical Length (um)	Single Unit (um)	Ten Units (um)
5/4/2005	5.13	4.44	0.064	0.641

Setting 10,000

	SM1	SM2	SM3	SM4	SM5
Screen	43.9	44	43.9	44	43.8

Date	# Spaces	Magnification
5/4/2005	43.9	7872

Rule

Date	Actual Length (um)	Theoretical Length (um)	Single Unit (um)	Ten Units (um)
5/4/2005	10.16	8.00	0.127	1.270

Spaces = The number of spaces spanned by the measurement or reported on calibration sheet. For the 18,000x screen mag., take the avg. of the five measurements recorded on the monthly calibration log. For the 10,000x screen mag., only one measurement is recorded on the monthly calibration log.

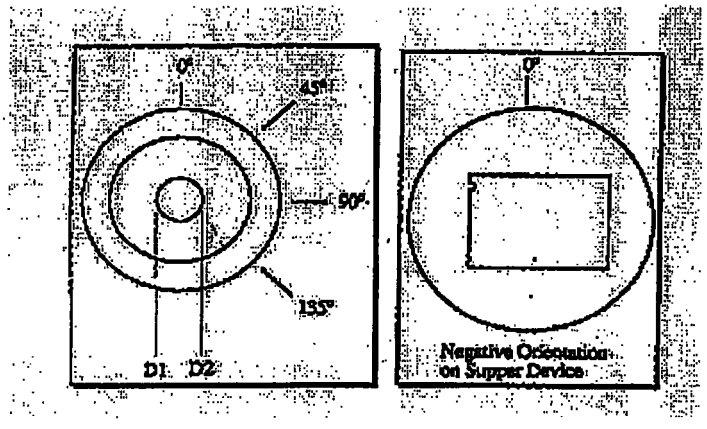
Screen Magnification = (160/# spaces) * 2160

Camera Length and Camera Constant Calibration (Version#1)

Date of Measurement:	6/13/2005	**Average Camera Constant:**	29.805 mmA
Negative Number:	J1667	(All 12 Measurements)	
Date Negative was Taken:	5/20/2005	**Average Camera Length:**	805.53 mm
Analyst:	MH	(All 12 Measurements)	

Ring #	0 degrees						45 degrees					
	D_1	D_2	D	R	CC	CL	D_1	D_2	D	R	CC	CL
1	63.50	89.05	25.55	12.78	30.09	813.11	65.25	90.50	25.25	12.63	29.73	803.56
2	61.45	90.95	29.50	14.75	30.08	812.84	63.15	92.40	29.25	14.63	29.82	805.96
3	55.10	97.30	42.20	21.10	30.43	822.33	57.05	98.40	41.35	20.68	29.81	805.77

Ring #	90 degrees						135 degrees					
	D_1	D_2	D	R	CC	CL	D_1	D_2	D	R	CC	CL
1	69.12	94.05	24.93	12.47	29.36	793.38	72.70	98.00	25.30	12.65	29.79	805.16
2	67.15	95.85	28.70	14.35	29.26	790.80	70.73	99.87	29.14	14.57	29.71	802.93
3	61.10	102.12	41.02	20.51	29.58	799.34	64.62	106.25	41.63	20.82	30.02	811.22



Measure the first three rings moving outward from the central spot of the diffraction pattern.

D_1 = The smaller measurement on the Supper device (mm).

D_2 = The larger measurement on the Supper device (mm).

$D = D_2 - D_1$

$R = D/2$

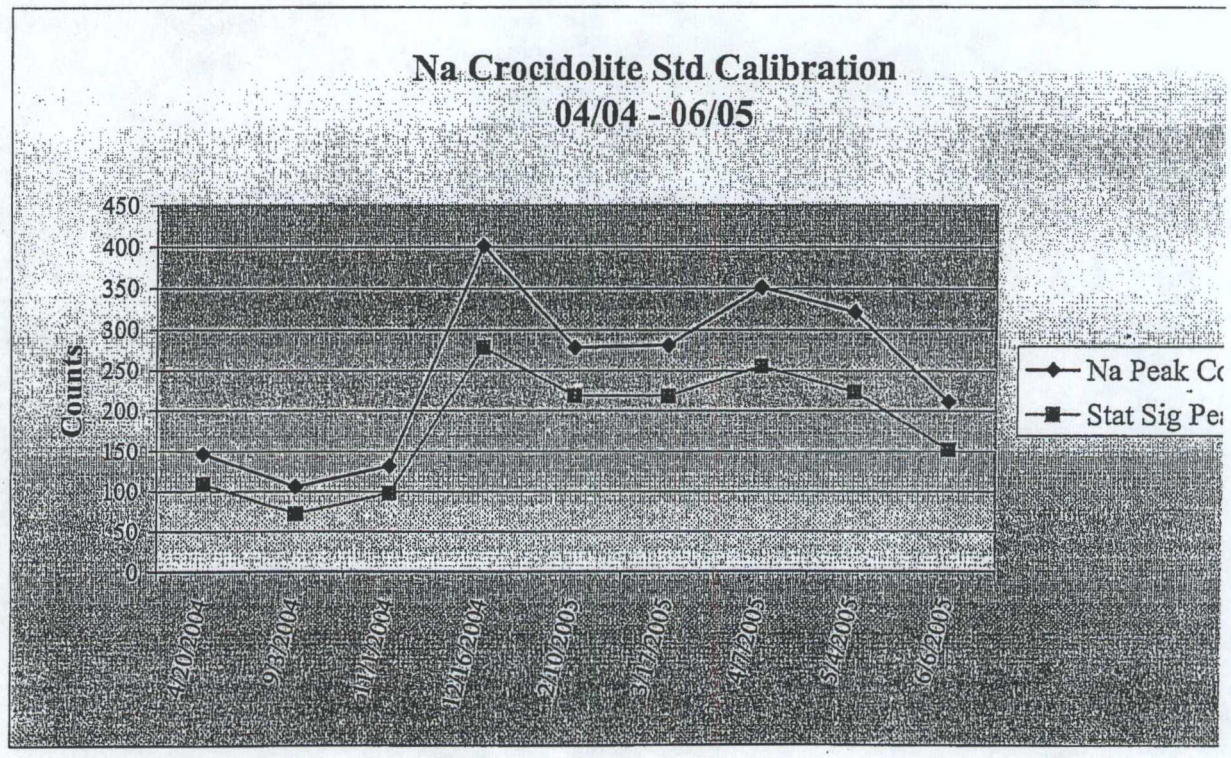
CC = Camera Constant

For Ring 1 [111], CC = R*2.355
For Ring 2 [200], CC = R*2.039
For Ring 3 [220], CC = R*1.442

CL = Camera Length = CC/0.037

Na Crocidolite Std. Calibration

Date	Analyst	EDS #	Fiber Size >5.0um	Peak Counts**	Background Counts***	Stat. Significant Peak	Pass/Fail
4/20/2004	JH	90	5.0 x 0.3	146	36	109	Pass
9/3/2004	KM	484		106	19	72	Pass
11/1/2004	JH	704		132	32	98	Pass
12/16/2004	JH	863		401	78	278.5	Pass
2/10/2005	JH	1034	13 x 0.25	278	80	219	Pass
3/17/2005	KM	1164		281	78	218.5	Pass
4/7/2005	KM	1219	55 x 0.8	351	80	255.5	Pass
5/4/2005	KM	1251	35 * 0.8	321	63	223.5	Pass
6/6/2005	KM	1397	25 * 0.7	211	47	152.5	Pass



BEAM DOSE CALIBRATION

(Version#1)

Date:	3/18/2005				
Analyst:	JH				
Microscope:	JEOL 1200EX				
Fiber Length used in analysis (um):					
Time (sec)	**Visual**	**Neg #**	**Recordable Diffraction**	**EDS**	**Photo**
0	Y	ND	ND*		
45	Y	1520	Y		
90	Y	1521	Y		
135	Y	1522	Y		
180	N	1523	Y		
225	N	1524	Y	J1167	J1525
PASS/FAIL	**PASS**		**PASS**		

*ND - Not Done

Visual - Mark "Y" if diffraction pattern is seen on screen, mark "N" if pattern is not seen on screen

Recordable Diffraction - Mark "Y" if diffraction pattern is seen on negative, mark "N" if pattern is not seen on negative

Chrysotile Fiber Specs.: Single fibril, >= 1.0 micron in length

Spot Size Calibration

Spot Size Calculation

Run #	Spot Size (mm)	Avg.SpotSize mm	CamMag	SpotSize nm	Historical Avg
1	3.2	3.3	18110.8	180.4	
2	3.3				
3	3.3				

Date	Spot size (nm)	UpperLimit (nm)	Analyst	Negative #	STD Spot Size	2S	25% Mean	Pass/Fail
3/17/05	180.4	250	JH	1527	0.00	0.00	0.00	Pass

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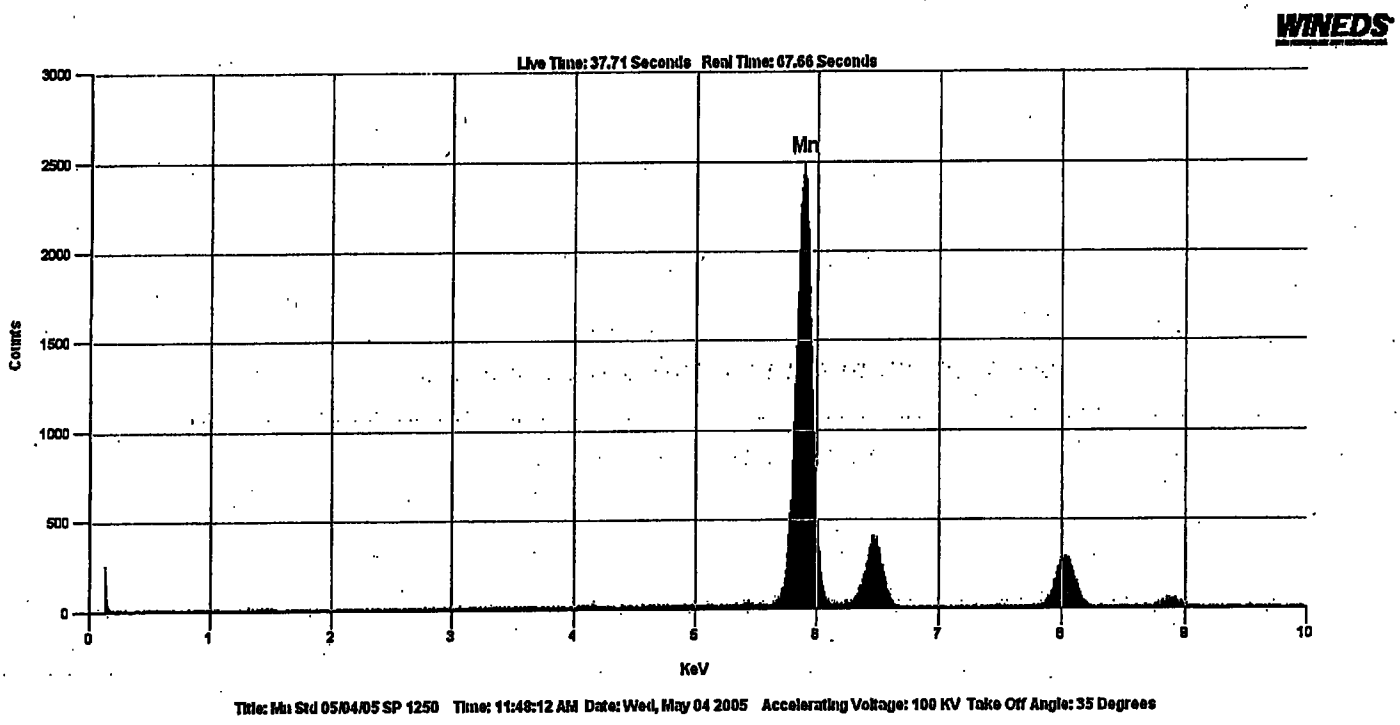

Quantitative Analysis Results - Standardless Analysis :
Mn Std 05/04/05 SP 1250 Wed, May 04 2005
EDS Parameters - 100KV, Takeoff Angle: 35.0°, Fit Index: 17.58
Correction: CLIFF LORIMER, Cycles: 1

Element	Atoms%	Compound	Weight%	Error(±)	Norm%
Mn	50.00	MnO	100.00	1.46	100.00
<Total>	100.00		100.00		100.00

Peak Statistics : Spectrum1

Peak	Energy	Height	FWHM	Area
1	0.152	70	54	406
2	5.891	2367	154	38884
3	6.479	364	160	6213
4	8.034	276	171	5045

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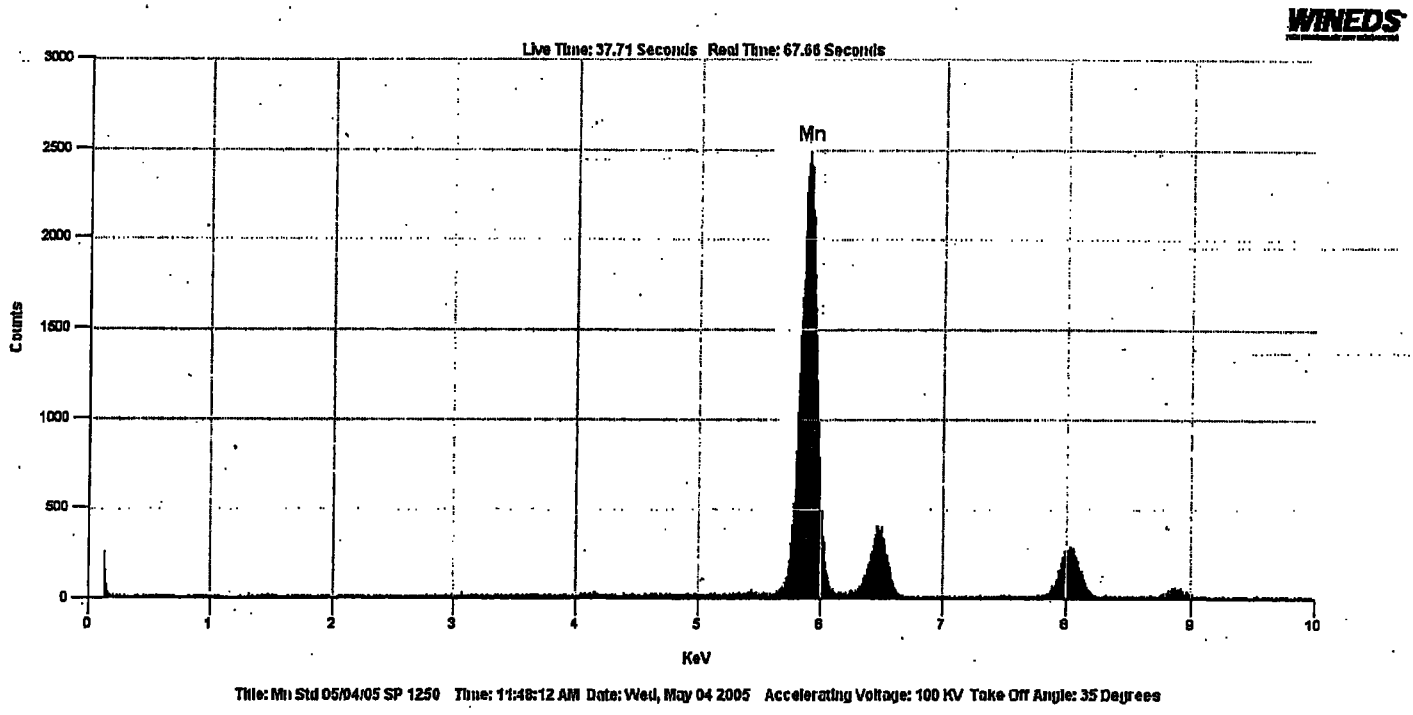
Jeol 1200 EX



Quantitative Analysis Results - Standardless Analysis :
Mn Std 05/04/05 SP 1250 Wed, May 04 2005
EDS Parameters - 100KV, Takeoff Angle: 35.0°, Fit Index: 17.58
Correction: CLIFF LORIMER, Cycles: 1

Element	Atoms%	Compound	Weight%	Error(±)	Norm%
Mn	50.00	MnO	100.00	1.46	100.00
<Total>	100.00		100.00		100.00

Peak Statistics : Spectrum1

Peak	Energy	Height	FWHM	Area
1	0.152	70	54	406
2	**5.891**	**2367**	**154**	**38884**
3	6.479	364	160	6213
4	8.034	276	171	5045