BOOK 2 OF 6.

K-ELK RIVER 77(4)B

CORE SAMPLES

ANALYSES.

D.H-21 TO D.H-40

276

Warnock Hersey Professional Services Ltd.

ELCO MINING LTD. CORE SAMPLE ANALYSIS

Hole No.: DH 21-1 Lab. No.: 77-2001 Date: February 25, 1977

HEAD RAW ANALYSIS						
R.M.%	Ash%	V.M.%	F.C.%	S.%	H.C.I.	REMARKS
0.8	21.9	29.5	47.8	0.70	78.8	Air Dried Basis
- - -	22.1	29.7	48.2	0.71	- - -	Dry Basis

SIZE / RAW ANALYSES								
Size Fraction	Wt. %	R.M.%	Ash %	S. %	CUMULATIVE			
					Wt. %	Ash %	S. %	
¼" x 65 m	91.6	1.0	22.2	0.67	91.6	22.2	0.67	A.D.B.
	91.6	- - -	22.4	0.68	91.6	22.4	0.68	D.B.
65m x 0	8.4	1.2	14.2	0.74	100.0	2.15	0.68	A.D.B.
	8.4	- - -	14.4	0.75	100.0	21.7	0.69	D.B.

SINK - FLOAT ANALYSIS: ¼" x 65 M									
S. G.	Wt.%	R.M%	Ash %	V.M%	F.C%	S.%	Cumulative		
							Wt. %	Ash %	
-1.40	67.2	1.2	4.3	34.2	60.1	0.75	67.2	4.3	A.D.B.
	67.3	- - -	4.4	34.6	61.0	0.77	67.3	4.4	D.B.
1.40-1.50	2.8	1.3	10.2	29.9	59.6	0.84	70.0	4.5	A.D.B.
	2.8	- - -	10.4	30.3	59.3	0.85	70.1	4.6	D.B.
1.50-1.60	1.7	1.2	23.9	- - -	- - -	- -	71.7	5.0	A.D.B.
	1.7	- - -	24.2	- - -	- - -	- -	71.8	5.1	D.B.
+1.60	28.3	0.8	67.6	- - -	- - -	- -	100.0	22.7	A.D.B.
	28.2	- - -	68.1	- - -	- - -	- -	100.0	22.8	D.B.

COMPOSITE ¼" x 65 m FLOATS @ 1.50 S.G., A.D.B.						
F.S.I.	F % in Coal	DILATATION TESTS				
		Softening Temp. (°C)	Max. Dil. Temp. (°C)	Maximum Contr. %	Maximum Dil. %	G.No.
8½	0.018					

Lab No. 8575 Date March 2/77

Client: Warnock Hersey

Sample Identification: 77-2001

Starting Temperature °C: 350

Softening Temperature °C: 362

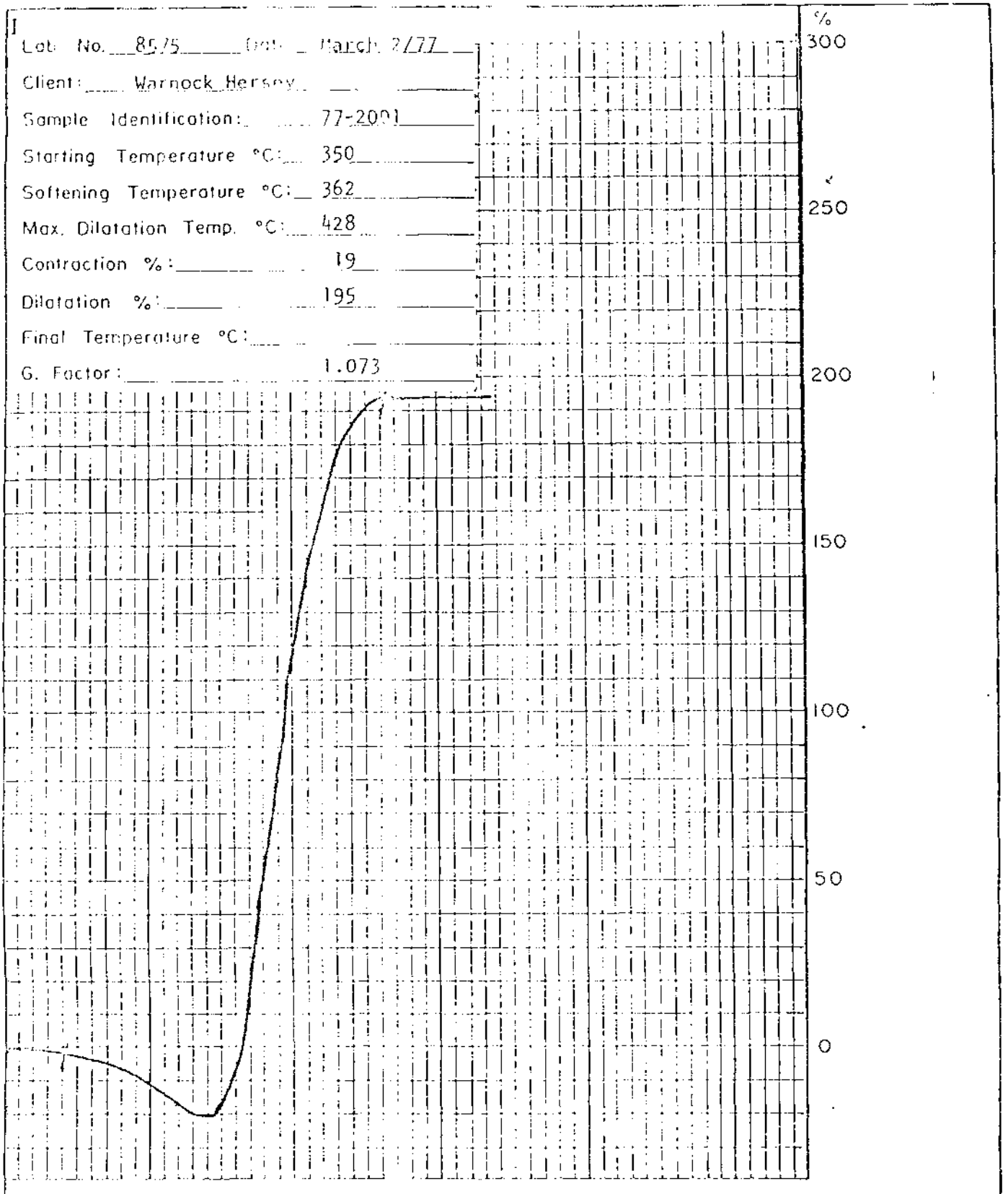
Max. Dilatation Temp. °C: 428

Contraction %: 19

Dilatation %: 195

Final Temperature °C:

G. Factor: 1.073



BIRTLEY ENGINEERING (CANADA) LTD.

Title	Date
RUHR DILATOMETER TEST	
	Drawn

Warnock Hersey Professional Services Ltd.

ELCO MINING LTD. CORE SAMPLE ANALYSIS

Hole No.: DH - 21 - 2 Lab. No.: 77 - 2002 Date: February 24, 1977

HEAD RAW ANALYSIS						
R.M.%	Ash%	V.M.%	F.C.%	S.%	H.G.I.	REMARKS
0.7	19.8	29.0	50.5	0.84	65.0	Air Dried Basis
- -	20.0	29.2	50.8	0.85	- - -	Dry Basis

SIZE / RAW ANALYSES								
Size Fraction	Wt. %	R.M.%	Ash %	S. %	CUMULATIVE Wt. %	CUMULATIVE Ash %	CUMULATIVE S. %	
¼" x 65m	95.4	0.8	19.2	0.83	95.4	19.2	0.83	A.D.B.
	95.4	- - -	19.4	0.84	95.4	19.4	0.84	D.B.
65m x 0	4.6	1.1	14.8	0.86	100.0	19.0	0.83	A.D.B.
	4.6	- - -	15.0	0.87	100.0	19.2	0.84	D.B.

SINK - FLOAT ANALYSIS: ¼" x 65 M									
S. G.	Wt.%	R.M%	Ash %	V.M%	F.C%	S.%	Cumulative Wt. %	Cumulative Ash %	
-1.40	69.0	0.8	7.4	35.0	56.8	0.90	69.0	7.4	A.D.B.
	69.0	- - -	7.5	35.3	57.2	0.91	69.0	7.5	D.B.
1.40-1.50	6.6	0.9	21.0	30.3	47.8	0.93	75.6	8.6	A.D.B.
	6.6	- - -	21.2	30.6	48.2	0.94	75.6	8.7	D.B.
1.50-1.60	4.4	0.9	26.5	- - -	- - -	- - -	80.0	9.6	A.D.B.
	4.4	- - -	26.7	- - -	- - -	- - -	80.-	9.7	D.B.
+1.60	20.0	0.8	61.2	- - -	- - -	- - -	100.0	19.9	A.D.B.
	20.0	- - -	61.7	- - -	- - -	- - -	100.0	20.1	D.B.

COMPOSITE ¼" x 65 m FLOATS @ 1.50 S.G., A.D.B.							
F.S.I.	F % on Coal	DILATATION TESTS Softening Temp.(°C)	Max. Dil. Temp.(°C)	Maximum Contr. %	Maximum Dil. %	G.No.	
7	0.036						

Lab No. 8576 Date March/77

Client: Warnock Hersey

Sample Identification: 77-2002

Starting Temperature °C: 350

Softening Temperature °C: 365

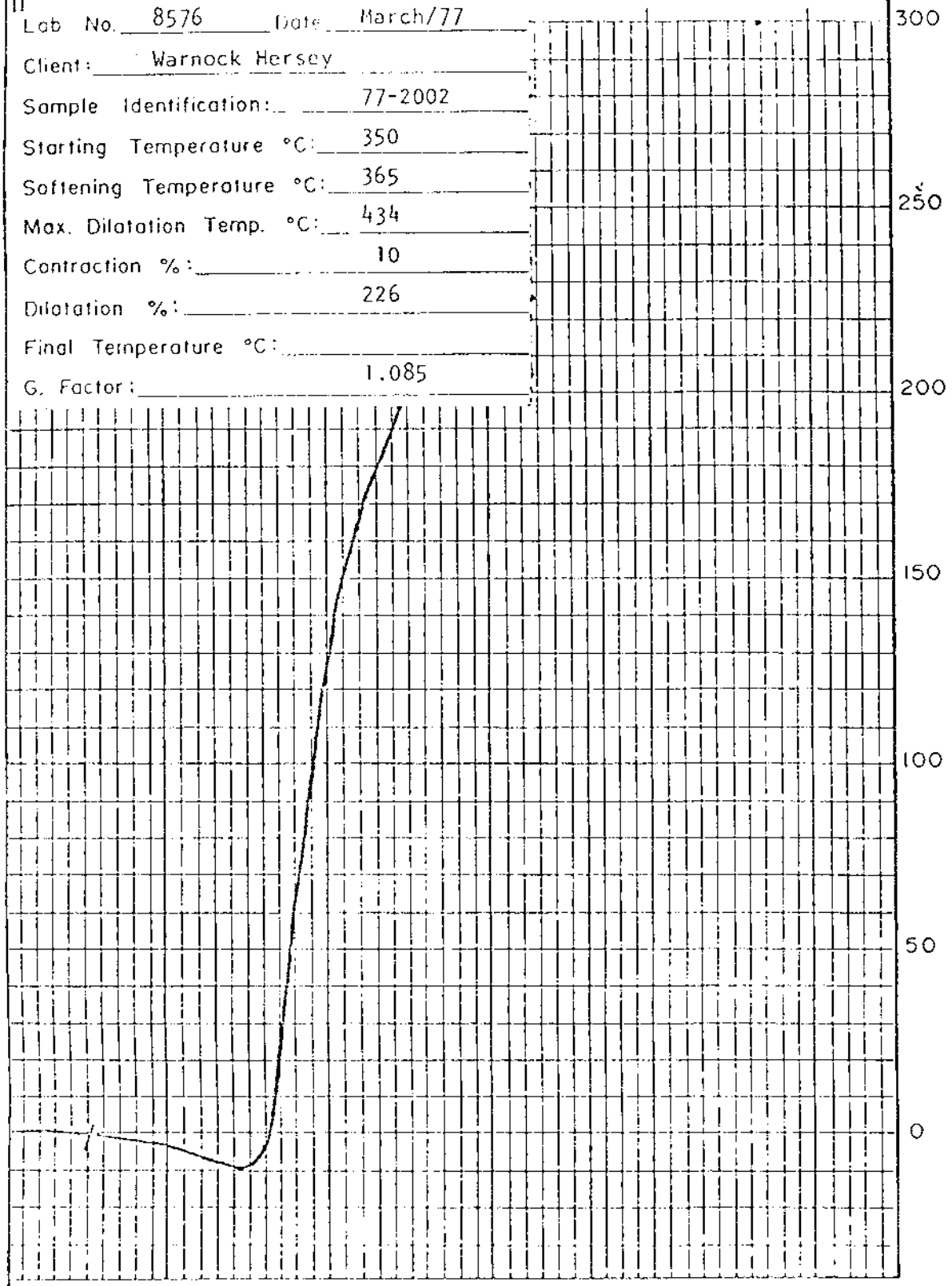
Max. Dilatation Temp. °C: 434

Contraction %: 10

Dilatation %: 226

Final Temperature °C:

G. Factor: 1.085



BIRTLEY ENGINEERING (CANADA) LTD.

Title	Date
RUHR DILATOMETER TEST	
	Drawn

Warnock Hersey Professional Services Ltd.

ELCO MINING LTD. CORE SAMPLE ANALYSIS

Hole No.: DH 21 - 3 Lab. No.: 77 - 2003 Date: February 24, 1977

HEAD RAW ANALYSIS						
R.M.%	Ash%	V.M.%	F.C.%	S.%	H.G.I.	REMARKS
0.7	13.8	30.9	54.6	0.88	71.2	Air Dried Basis
- - -	13.9	31.1	55.0	0.89	- - -	Dry Basis

SIZE / RAW ANALYSES								
Size Fraction	Wt. %	R.M.%	Ash %	S. %	CUMULATIVE			
					Wt. %	Ash %	S. %	
¼" x 65m	94.3	0.9	14.0	0.86	94.3	14.0	0.86	A.D.B.
	94.3	- - -	14.1	0.87	94.3	14.1	0.87	D.B.
65m x 0	5.7	1.0	12.3	0.88	100.0	13.9	0.86	A.D.B.
	5.7	- - -	12.4	0.89	100.0	14.0	0.87	D.B.

SINK - FLOAT ANALYSIS: ¼" x 65 M									
S. G.	Wt.%	R.M%	Ash %	V.M%	F.C%	S.%	Cumulative		
							Wt. %	Ash %	
-1.40	76.6	0.8	3.5	36.6	59.1	0.94	76.6	3.5	A.D.B.
	76.6	- - -	3.6	36.8	59.6	0.95	76.6	3.6	D.B.
1.40-1.50	3.3	0.9	19.8	28.9	50.4	0.85	79.9	4.2	A.D.B.
	3.3	- - -	19.9	29.2	50.9	0.86	79.9	4.3	D.B.
1.50-1.60	9.0	0.8	36.2	- - -	- - -	- - -	88.9	7.4	A.D.B.
	9.0	- - -	36.5	- - -	- - -	- - -	88.9	7.6	D.B.
+1.60	11.1	0.8	57.6	- - -	- - -	- - -	100.0	13.0	A.D.B.
	11.1	- - -	58.1	- - -	- - -	- - -	100.0	13.2	D.B.

COMPOSITE ¼" x 65 m FLOATS @ 1.50 S.G., A.D.B.							
F.S.I.	F % on Coal	DILATATION TESTS					
		Softening Temp. (°C)	Max. Dil. Temp. (°C)	Maximum Contr. %	Maximum Dil. %	G.No.	
7	0.038						

Lab. No. 8577 Date March/77

Client: Warnock Hersey

Sample Identification: 77-2003

Starting Temperature °C: 350

Softening Temperature °C: 362

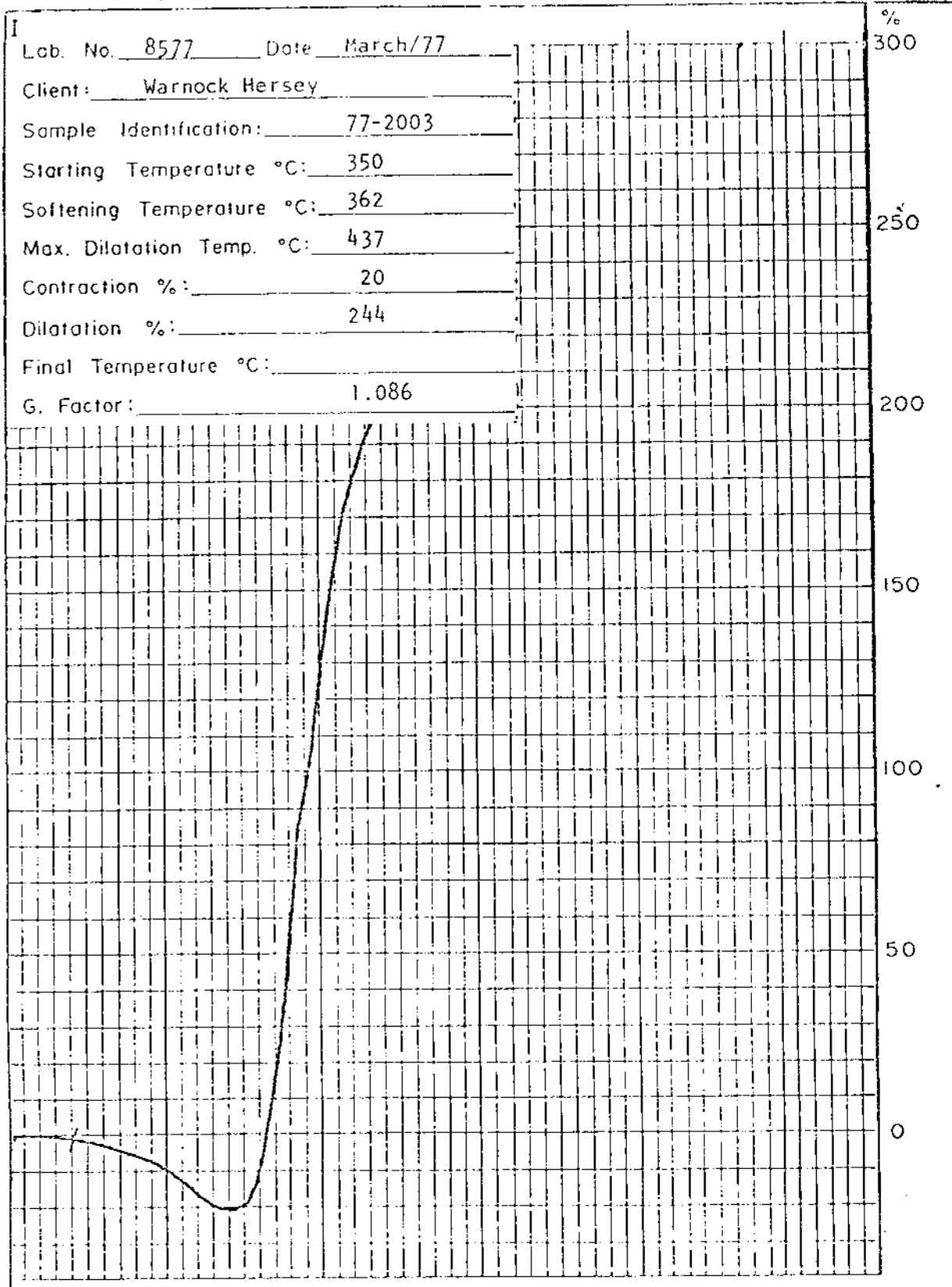
Max. Dilatation Temp. °C: 437

Contraction %: 20

Dilatation %: 244

Final Temperature °C:

G. Factor: 1.086



BIRTLEY ENGINEERING (CANADA) LTD.

Title	Date
RUHR DILATOMETER TEST	
	Drawn

Warnock Hersey Professional Services Ltd.

ELCO MINING LTD. CORE SAMPLE ANALYSIS

Hole No.: DH 21 - 4 Lab. No.: 77 - 2004 Date: February 25, 1977

HEAD RAW ANALYSIS						
R.M.%	Ash%	V.M.%	F.C.%	S.%	H.G.I.	REMARKS
0.7	43.2	24.8	31.3	1.15	69.8	Air Dried Basis
- - -	43.5	24.9	31.6	1.16	- - -	Dry Basis

SIZE / RAW ANALYSES								
Size Fraction	Wt. %	R.M.%	Ash %	S. %	CUMULATIVE			
					Wt. %	Ash %	S. %	
¼" x 65 m	91.3	0.8	44.8	1.16	91.3	44.8	1.16	A.D.B.
	91.4	- - -	45.1	1.17	91.4	45.1	1.17	D.B.
65m x 0	8.7	1.0	31.3	1.35	100.0	43.6	1.18	A.D.B.
	8.6	- - -	31.6	1.36	100.0	43.9	1.18	D.B.

SINK - FLOAT ANALYSIS: ¼" x 65 M									
S. G.	Wt.%	R.M%	Ash %	V.M%	F.C%	S.%	Cumulative		
							Wt. %	Ash %	
-1.40	38.5	1.0	3.7	33.9	61.4	1.18	38.5	3.7	A.D.B.
	38.5	- - -	3.8	34.3	61.9	1.19	38.5	3.7	D.B.
1.40-1.50	1.9	0.9	19.8	29.1	50.2	0.94	40.4	4.5	A.D.B.
	1.9	- - -	20.0	29.4	50.6	0.95	40.4	4.6	D.B.
1.50-1.60	1.7	0.9	30.4	- - -	- - -	- - -	42.1	5.5	A.D.B.
	1.7	- - -	30.7	- - -	- - -	- - -	42.1	5.6	D.B.
+1.60	57.9	0.8	75.3	- - -	- - -	- - -	100.0	45.9	A.D.B.
	57.9	- - -	75.9	- - -	- - -	- - -	100.0	46.3	D.B.

COMPOSITE ¼" x 65 m FLOATS @ 1.50 S.G., A.D.B.						
F.S.I.	P % on Coal	DILATATION TESTS				
		Softening Temp.(°C)	Max. Dil. Temp.(°C)	Maximum Contr. %	Maximum Dil. %	G.No.
7½	0.027					

II

Lab. No. 8578 Date March/77

Client: Warnock Hersey

Sample Identification: 77-2004

Starting Temperature °C: 350

Softening Temperature °C: 368

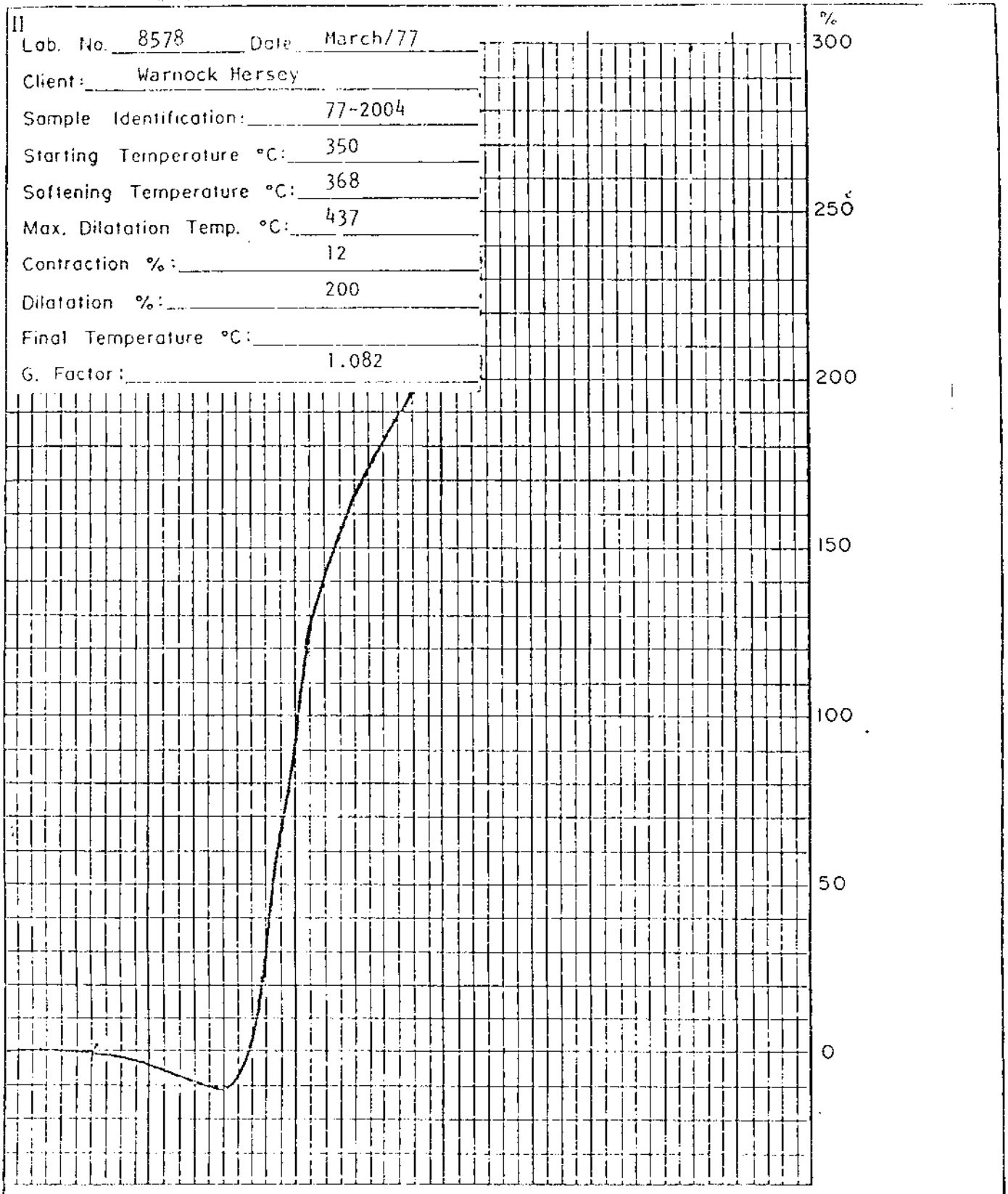
Max. Dilatation Temp. °C: 437

Contraction %: 12

Dilatation %: 200

Final Temperature °C:

G. Factor: 1.082



BIRTLEY ENGINEERING (CANADA) LTD.

Title	Date
RUHR DILATOMETER TEST	Drawn

Warnock Hersey Professional Services Ltd

ELCO MINING LTD. CORE SAMPLE ANALYSIS

Hole No.: DH 21-5 Lab. No.: 77-2005 Date: February 28, 1977

HEAD RAW ANALYSIS						
R.M.%	Ash%	V.M.%	F.C.%	S.%	H.G.I.	REMARKS
0.8	10.0	31.2	58.0	0.92	82.3	Air Dried Basis
- - -	10.1	31.4	58.5	0.93	- - -	Dry Basis

SIZE / RAW ANALYSES								
Size Fraction	Wt. %	R.M.%	Ash %	S. %	CUMULATIVE			
					Wt. %	Ash %	S. %	
¼" x 65 m	95.4	0.9	8.7	0.97	95.4	8.7	0.97	A.D.B.
	95.4	- - -	8.8	0.98	95.4	8.8	0.98	D.B.
65m x 0	4.6	1.0	14.6	0.99	100.0	9.0	0.97	A.D.B.
	4.6	- - -	14.7	1.00	100.0	9.1	0.98	D.B.

SINK - FLOAT ANALYSIS: ¼" x 65 M									
S. G.	Wt.%	R.M%	Ash %	V.M%	F.C%	S.%	Cumulative		
							Wt. %	Ash %	
-1.40	92.6	0.9	4.4	32.7	62.6	0.96	92.6	4.4	A.D.B.
	92.6	- - -	4.4	33.0	63.2	0.97	92.6	4.4	D.B.
1.40-1.50	2.3	1.0	11.2	30.5	57.3	0.92	94.9	4.6	A.D.B.
	2.3	- -	11.3	30.8	57.9	0.93	94.9	4.6	D.B.
1.50-1.60	0.9	1.1	15.0	- - -	- - -	- - -	95.8	4.7	A.D.B.
	0.9	- -	15.2	- - -	- - -	- - -	95.8	4.7	D.B.
+1.60	4.2	0.9	85.7	- -	- - -	- - -	100.0	8.1	A.D.B.
	4.2	- -	86.5	- - -	- - -	- - -	100.0	8.1	D.B.

COMPOSITE ¼" x 65 m FLOATS @ 1.50 S.G., A.D.B.						
F.S.I.	P % on Coal	DILATATION TESTS				
		Softening Temp.(°C)	Max. Dil. Temp.(°C)	Maximum Contr. %	Maximum Dil. %	G.No.
7½	0.042					

Lab. No 8579 Date March/77

Client: Warnock Hersey

Sample Identification: 77-2005

Starting Temperature °C: 350

Softening Temperature °C: 359

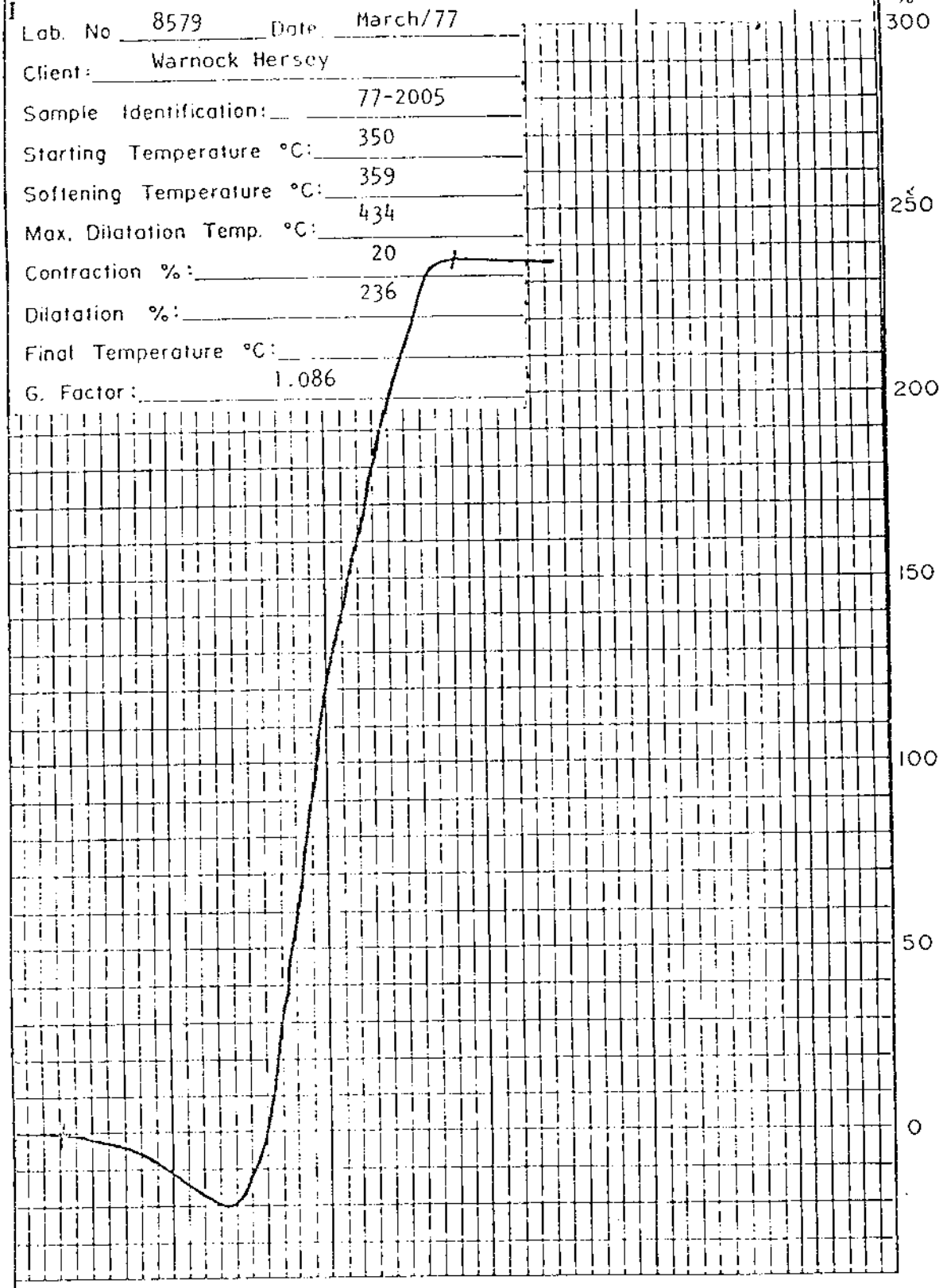
Max. Dilatation Temp. °C: 434

Contraction %: 20

Dilatation %: 236

Final Temperature °C:

G. Factor: 1.086



BIRTLEY ENGINEERING (CANADA) LTD.

Title

RUHR DILATOMETER TEST

Date

Drawn

Warnock Hersey Professional Services Ltd.

ELCO MINING LTD. CORE SAMPLE ANALYSIS

Hole No.: DH 21 - 6 Lab. No.: 77 - 2006 Date: February 28, 1977

HEAD RAW ANALYSIS						
R.M.%	Ash%	V.M.%	F.C.%	S.%	H.G.I.	REMARKS
0.6	31.0	24.7	43.7	0.54	61,5	Air Dried Basis
- --	31.2	24.9	43.9	0.54	- --	Dry Basis

SIZE / RAW ANALYSES								
Size Fraction	Wt. %	R.M.%	Ash %	S. %	CUMULATIVE			
					Wt. %	Ash %	S. %	
¼" x 65m	93.5	0.8	30.9	0.59	93.5	30.9	0.59	A.D.B.
	93.5	- --	31.2	0.59	93.6	31.2	0.59	D.B.
65m x 0	6.5	1.0	23.3	0.79	100.0	30.4	0.60	A.D.B.
	6.5	- - -	23.5	0.80	100.0	30.7	0.60	D.B.

SINK - FLOAT ANALYSIS: ¼" x 65 M									
S. G.	Wt.%	R.M%	Ash %	V.M%	F.C%	S.%	Cumulative		
							Wt. %	Ash %	
-1.40	48.4	0.7	8.1	33.1	58.1	0.84	48.4	8.1	A.D.B.
	48.4	- --	8.1	33.4	58.5	0.85	48.4	8.1	D.B.
1.40-1.50	11.8	0.8	24.4	26.2	48.6	0.67	60.2	11.3	A.D.B.
	11.8	- --	24.6	26.4	49.0	0.68	60.2	11.3	D.B.
1.50-1.60	6.3	0.8	31.2	- --	- --	- - -	66.5	13.2	A.D.B.
	6.3	- --	31.4	- --	- - -	- - -	66.5	13.2	D.B.
+1.60	33.5	1.0	66.1	- --	- --	- --	100.0	30.9	A.D.B.
	33.5	- --	66.8	- --	- --	- --	100.0	31.2	D.B.

COMPOSITE ¼" x 65 m FLOATS @ 1.50 S.G., A.D.B.						
F.S.I.	P % on Coal	DILATATION TESTS				
		Softening Temp. (°C)	Max. Dil. Temp. (°C)	Maximum Contr. %	Maximum Dil. %	G.No.
8	0.062					

Warnock Hersey Professional Services Ltd.

ELCO MINING LTD. CORE SAMPLE ANALYSIS

Hole No.: DH 21 - 7 Lab. No.: 77 - 2007 Date: February 24, 1977

HEAD RAW ANALYSIS						
R.M.%	Ash%	V.M.%	F.C %	S.%	H.G.I.	REMARKS
0.8	7.3	32.0	59.9	0.78	148.8	Air Dried Basis
- - -	7.4	32.3	60.3	0.79	- - -	Dry Basis

SIZE / RAW ANALYSIS								
Size Fraction	Wt. %	R.M.%	Ash %	S. %	CUMULATIVE Wt. %	CUMULATIVE Ash %	CUMULATIVE S. %	
¼" x 65m	90.1	0.8	6.8	0.79	90.1	6.8	0.79	A.D.B.
	90.1	- - -	6.9	0.80	90.1	6.9	0.80	D.B.
65m x 0	9.9	1.1	4.9	0.80	100.0	6.6	0.79	A.D.B.
	9.9	- - -	4.9	0.81	100.0	6.7	0.80	D.B.

SINK - FLOAT ANALYSIS: ¼" x 65 M									
S. G.	Wt.%	R.M%	Ash %	V.M%	F.C%	S.%	Cumulative Wt. %	Cumulative Ash %	
-1.40	91.3	2.5	3.4	32.9	61.2	0.74	91.3	3.4	A.D.B.
	91.3	- - -	3.5	33.7	62.8	0.76	91.3	3.4	D.B.
1.40-1.50	3.1	1.2	16.4	28.8	53.6	0.64	94.4	3.8	A.D.B.
	3.1	- - -	16.6	29.2	54.2	0.65	94.4	3.9	D.B.
1.50-1.60	1.5	1.1	21.3	- - -	- - -	- - -	95.9	4.1	A.D.B.
	1.5	- - -	21.5	- - -	- - -	- - -	95.9	4.2	D.B.
+1.60	4.1	1.2	66.5	- - -	- - -	- - -	100.0	6.6	A.D.B.
	4.1	- - -	66.0	- - -	- - -	- - -	100.0	6.7	D.B.

COMPOSITE ¼" x 65 m FLOATS @ 1.50 S.G., A.D.B.						
F.S.I.	I % on Coal	DILATATION TESTS: Softening Temp. (°C)	Max. Dil. Temp. (°C)	Maximum Contr. %	Maximum Dil. %	G.No.
8½	0.019					

Lab No. 8581 Date March/77

Client: Warnock Hersey

Sample Identification: 77-2007

Starting Temperature °C: 350

Softening Temperature °C: 365

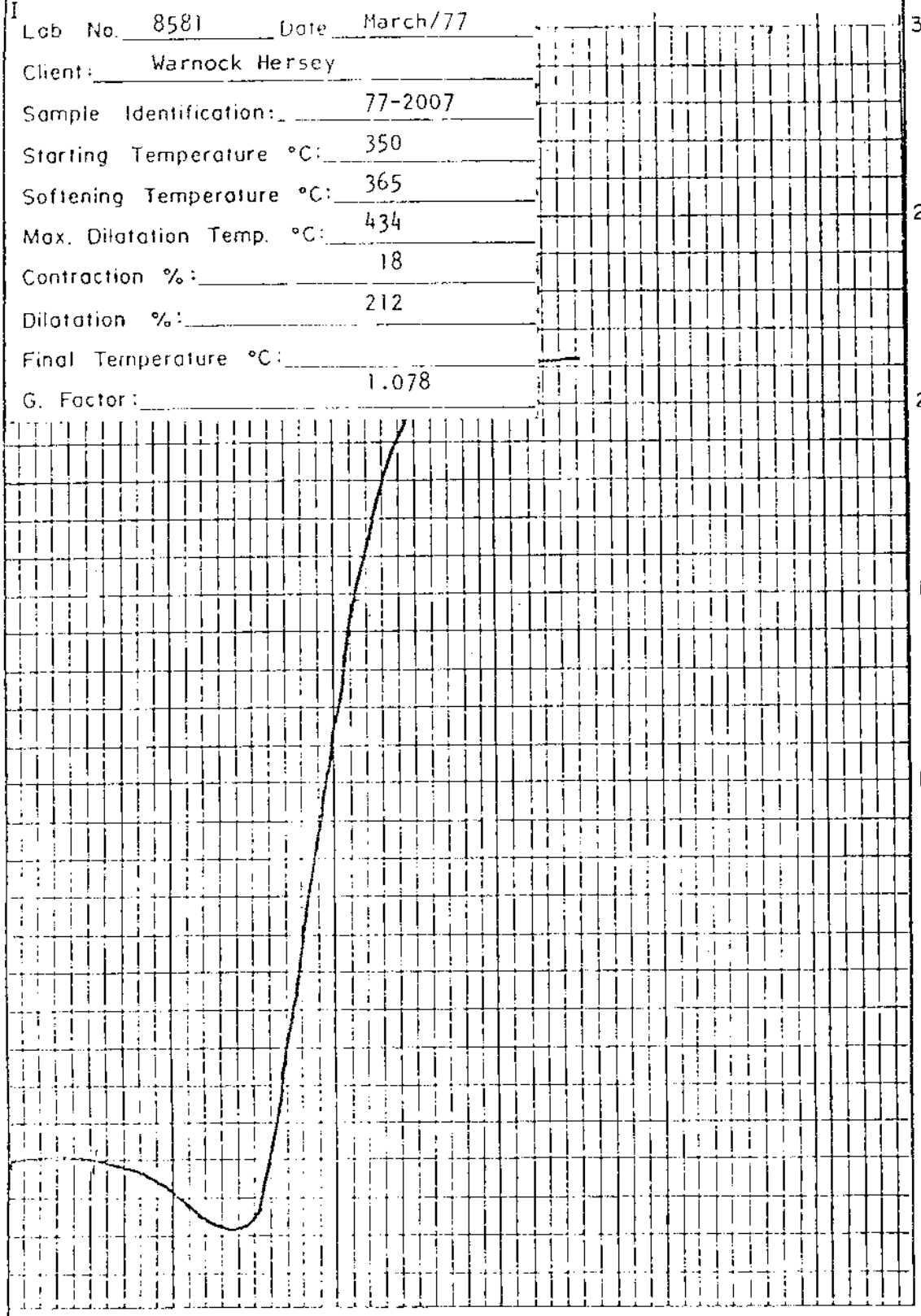
Max. Dilatation Temp. °C: 434

Contraction %: 18

Dilatation %: 212

Final Temperature °C:

G. Factor: 1.078



BIRTLEY ENGINEERING (CANADA) LTD.

Title

RUHR DILATOMETER TEST

Date

Drawn

ELCO MINING LTD. CORE SAMPLE ANALYSIS

Hole No.: DH 22 - 1 Lab. No.: 77 - 3042 Date: March 25, 1977

HEAD RAW ANALYSIS						
R.M.%	Ash%	V.M.%	F.C %	S.%	H.G.I.	REMARKS
0.6	24.4	18.9	56.1	0.40	82.3	Air Dried Basis
- -	24.5	19.0	56.5	0.40	- - -	Dry Basis

SIZE / RAW ANALYSES								
Size Fraction	Wt. %	R.M.%	Ash %	S. %	CUMULATIVE			
					Wt. %	Ash %	S. %	
¼ x 65	87.9	0.5	23.8	0.44	87.9	23.8	0.44	A.D.B.
	87.9	- - -	23.9	0.44	87.9	23.9	0.44	D.B.
65 x 0	12.1	0.7	21.4	0.46	100.0	23.5	0.44	A.D.B.
	12.1	- - -	21.5	0.46	100.0	23.6	0.44	D.B.

SINK - FLOAT ANALYSIS: ¼" x 65 M									
S. G.	Wt.%	R.M%	Ash %	V.M%	F.C%	S.%	Cumulative		
							Wt. %	Ash %	
-1.40	58.9	0.5	5.8	21.2	72.5	0.42	58.9	5.8	A.D.B.
	58.9	- - -	5.8	21.3	72.9	0.42	58.9	5.8	D.B.
1.40-1.50	12.0	0.5	14.1	18.7	66.7	0.38	70.9	7.2	A.D.B.
	12.0	- - -	14.2	18.8	67.0	0.38	70.9	7.2	D.B.
1.50-1.60	3.1	0.4	23.7	- - -	- - -	- - -	74.0	7.9	A.D.B.
	3.1	- - -	23.8	- - -	- - -	- - -	74.0	7.9	D.B.
+1.60	26.0	0.6	67.9	- - -	- - -	- - -	100.0	23.5	A.D.B.
	26.0	- - -	68.3	- - -	- - -	- - -	100.0	23.6	D.B.

COMPOSITE ¼" x 65 M FLOATS @ 1.50 S.G., A.D.B.						
F.S.I.	F % on Coal	DILATATION TESTS				
		Softening Temp.(°C)	Max. Dil. Temp.(°C)	Maximum Contr. %	Maximum Dil. %	G.No.
4	0.036					

Warnock Hersey Professional Services Ltd.

ELCO MINING LTD. CORE SAMPLE ANALYSIS

Hole No.: DH 22 - 2 Lab. No.: 77 - 3043 Date: March 28, 1977

HEAD RAW ANALYSIS						
R.M.%	Ash%	V.M.%	F.C.%	S.%	H.G.I.	REMARKS
0.4	19.0	17.4	63.2	0.44	110.0	Air Dried Basis
- - -	19.1	17.5	63.4	0.44	- - -	Dry Basis

SIZE / RAW ANALYSES								
Size Fraction	Wt. %	R.M.%	Ash %	S. %	CUMULATIVE			
					Wt. %	Ash %	S. %	
¼ x 65	87.6	0.4	19.0	0.48	87.6	19.0	0.48	A.D.B.
	87.6	- -	19.1	0.48	87.6	19.1	0.48	D.B.
65 x 0	12.4	0.6	13.6	0.52	100.0	18.3	0.48	A.D.B.
	12.4	- -	13.7	0.52	100.0	18.4	0.48	D.B.

SINK - FLOAT ANALYSIS: ¼" x 65 M									
S. G.	Wt.%	R.M%	Ash %	V.M%	F.C%	S.%	Cumulative		
							Wt. %	Ash %	
-1.40	66.9	1.0	5.8	21.1	72.1	0.56	66.9	5.8	A.D.B.
	66.9	- -	5.9	21.4	72.7	0.57	66.9	5.9	D.B.
1.40-1.50	8.2	0.9	13.4	18.8	66.9	0.41	75.1	6.6	A.D.B.
	8.2	- - -	13.6	19.0	67.4	0.41	75.1	6.7	D.B.
1.50-1.60	5.3	1.0	20.5	- -	- -	- -	80.4	7.5	A.D.B.
	5.3	- -	20.8	- - -	- - -	- -	80.4	7.7	D.B.
+1.60	19.6	0.7	64.2	- - -	- - -	- - -	100.0	18.6	A.D.B.
	19.6	- - -	64.6	- - -	- - -	- - -	100.0	18.8	D.B.

COMPOSITE ¼" x 65 m FLOATS @ 1.50 S.G., A.D.B.						
F.S.I.	P % on Coal	DILATATION TESTS				
		Softening Temp.(°C)	Max. Dil. Temp.(°C)	Maximum Contr. %	Maximum Dil. %	G.No.
5	0.033					

Warnock Hersey Professional Services Ltd.

ELCO MINING LTD. CORE SAMPLE ANALYSIS

Hole No.: DH 22 - 3 Lab. No.: 77 - 3044 Date: March 28, 1977

HEAD RAW ANALYSIS						
R.M.%	Ash%	V.M.%	F.C.%	S.%	H.G.I.	REMARKS
0.4	16.2	18.2	65.2	0.46	94.1	Air Dried Basis
- - -	16.3	18.3	65.4	0.46	- - -	Dry Basis

SIZE / RAW ANALYSES								
Size Fraction	Wt. %	R.M.%	Ash %	S. %	CUMULATIVE			
					Wt. %	Ash %	S. %	
¼ x 65	88.6	0.4	16.1	0.50	88.6	16.1	0.50	A.D.B.
	88.6	- -	16.2	0.50	88.6	16.2	0.50	D.B.
65 x 0	11.4	0.6	14.3	0.52	100.0	15.9	0.50	A.D.B.
	11.4	- - -	14.4	0.52	100.0	16.0	0.50	D.B.

SINK - FLOAT ANALYSIS: ¼" x 65 M									
S. G.	Wt.%	R.M%	Ash %	V.M%	F.C%	S.%	Cumulative		
							Wt. %	Ash %	
-1.40	66.4	0.6	6.2	19.7	73.5	0.42	66.4	6.2	A.D.B.
	66.4	- -	6.2	19.8	74.0	0.42	66.4	6.2	D.B.
1.40-1.50	14.1	0.5	15.1	18.7	65.7	0.36	80.5	7.8	A.D.B.
	14.1	- -	15.2	18.8	66.0	0.36	80.5	7.8	D.B.
1.50-1.60	6.0	0.6	22.7	- - -	- - -	- - -	86.5	8.8	A.D.B.
	6.0	- - -	22.8	- - -	- - -	- - -	86.5	8.8	D.B.
+1.60	13.5	0.9	60.1	- - -	- - -	- - -	100.0	15.7	A.D.B.
	13.5	- - -	60.6	- - -	- - -	- - -	100.0	15.8	D.B.

COMPOSITE ¼" x 65 m FLOATS @ 1.50 S.G., A.D.B.						
F.S.I.	F % on Coal	DILATATION TESTS				
		Softening Temp.(°C)	Max. Dil. Temp.(°C)	Maximum Contr. %	Maximum Dil. %	G.No.
5	0.018					

Warnock Hersey Professional Services Ltd.

ELCO MINING LTD. CORE SAMPLE ANALYSIS

Hole No.: DH 22 - 4 Lab. No.: 77 - 3045 Date: March 25, 1977

HEAD RAW ANALYSIS						
F.M.%	Ash%	V.M.%	F.C %	S.%	H.G.I.	REMARKS
0.6	24.8	16.2	58.4	0.50	119.0	Air Dried Basis
- - -	24.9	16.3	58.8	0.50	- - -	Dry Basis

SIZE / RAW ANALYSES								
Size Fraction	Wt. %	R.M.%	Ash %	S. %	CUMULATIVE			
					Wt. %	Ash %	S. %	
¼ x 65	85.6	0.4	26.0	0.52	85.6	26.0	0.52	A.D.B.
	85.6	- - -	26.1	0.52	85.6	26.1	0.52	D.B.
65 x 0	14.4	0.6	16.8	0.59	100.0	24.7	0.53	A.D.B.
	14.4	- - -	16.9	0.59	100.0	24.8	0.53	D.B.

SINK - FLOAT ANALYSIS: ¼" x 65 M									
S. G.	Wt.%	R.M%	Ash %	V.M%	F.C%	S.%	Cumulative		
							Wt. %	Ash %	
-1.40	52.4	1.6	6.1	20.3	72.0	0.54	52.4	6.1	A.D.B.
	52.4	- - -	6.2	20.6	73.2	0.55	52.4	6.2	D.B.
1.40-1.50	10.9	0.9	14.3	18.7	66.1	0.48	63.3	7.5	A.D.B.
	10.9	- - -	14.4	18.9	66.7	0.48	63.3	7.6	D.B.
1.50-1.60	6.4	1.0	20.2	- - -	- - -	- - -	69.7	8.7	A.D.B.
	6.4	- - -	20.4	- - -	- - -	- - -	69.7	8.8	D.B.
+1.60	30.3	1.0	62.6	- - -	- - -	- - -	100.0	25.0	A.D.B.
	30.3	- - -	63.3	- - -	- - -	- - -	100.0	25.3	D.B.

COMPOSITE ¼" x 65 m FLOATS @ 1.50 S.G., A.D.B.						
F.S.I.	F % on Coal	DILATATION TESTS				
		Softening Temp.(°C)	Max. Dil. Temp.(°C)	Maximum Contr. %	Maximum Dil. %	G.No.
4½	0.024					

Warnock Hersey Professional Services Ltd.

ELCO MINING LTD. CORE SAMPLE ANALYSIS

Hole No.: DH 22 - 5 Lab. No.: 77 - 3046 Date: March 28, 1977

HEAD RAW ANALYSIS						
R.M.%	Ash%	V.M.%	F.C.%	S.%	H.G.I.	REMARKS
1.0	17.9	16.7	64.4	0.54	83.0	Air Dried Basis
- - -	18.1	16.8	65.1	0.55	- - -	Dry Basis

SIZE / RAW ANALYSES								
Size Fraction	Wt. %	R.M.%	Ash %	S. %	CUMULATIVE Wt. %	CUMULATIVE Ash %	CUMULATIVE S. %	
¼ x 65	88.1	0.4	17.6	0.60	88.1	17.6	0.60	A.D.B.
	88.1	- - -	17.7	0.60	88.1	17.7	0.60	D.B.
65 x 0	11.9	0.5	13.0	0.64	100.0	17.1	0.60	A.D.B.
	11.9	- - -	13.1	0.64	100.0	17.2	0.60	D.B.

SINK - FLOAT ANALYSIS: ¼" x 65 M									
S. G.	Wt.%	R.M%	Ash %	V.M%	F.C%	S.%	Cumulative Wt. %	Cumulative Ash %	
-1.40	64.2	0.4	6.4	19.3	73.9	0.56	64.2	6.4	A.D.B.
	64.2	- -	6.5	19.4	74.1	0.56	64.2	6.5	D.B.
1.40-1.50	12.1	0.4	13.4	17.7	68.5	0.54	76.3	7.5	A.D.B.
	12.1	- - -	13.4	17.8	68.8	0.54	76.3	7.6	D.B.
1.50-1.60	6.2	0.5	19.9	- -	- -	- -	82.5	8.4	A.D.B.
	6.2	- -	20.0	- -	- -	- -	82.5	8.5	D.B.
+1.60	17.5	0.5	58.4	- -	- -	- -	100.0	17.2	A.D.B.
	17.5	- -	58.7	- -	- -	- -	100.0	17.3	D.B.

COMPOSITE ¼" x 65 m FLOATS @ 1.50 S.G., A.D.B.						
R.S.I.	P % on Coal	DILATATION TESTS Softening Temp.(°C)	Max. Dil. Temp.(°C)	Maximum Contr. %	Maximum Dil. %	G.No.
4	0.029					

Warnock Hersey Professional Services Ltd.

ELCO MINING LTD. CORE SAMPLE ANALYSIS

Hole No.: DH 22 - 6 Lab. No.: 77 - 3047 Date: March 25, 1977.

HEAD RAW ANALYSIS						
R.M.%	Ash%	V.M.%	F.C %	S.%	H.G.I.	REMARKS
0.6	47.4	13.7	38.3	0.52	72.0	Air Dried Basis
- - -	47.7	13.8	38.5	0.52	- - -	Dry Basis

SIZE / RAW ANALYSES								
Size Fraction	Wt. %	R.M.%	Ash %	S. %	CUMULATIVE			
					Wt. %	Ash %	S. %	
¼ x 65	89.4	0.5	48.7	0.50	89.4	48.7	0.50	A.D.B.
	89.4	- - -	49.0	0.50	89.4	49.0	0.50	D.B.
65 x 0	10.6	0.7	32.1	0.61	100.0	46.9	0.51	A.D.B.
	10.6	- - -	32.3	0.61	100.0	47.2	0.51	D.B.

SINK - FLOAT ANALYSIS: ¼" x 65 M									
S. G.	Wt.%	R.M%	Ash %	V.M%	F.C%	S.%	Cumulative		
							Wt. %	Ash %	
-1.40	16.9	0.3	7.8	25.8	66.1	0.75	16.9	7.8	A.D.B.
	16.9	- - -	7.8	25.8	66.4	0.75	16.9	7.8	D.B.
1.40-1.50	10.9	0.4	16.5	19.2	63.9	0.65	27.8	11.2	A.D.B.
	10.9	- - -	16.5	19.2	64.3	0.65	27.8	11.2	D.B.
1.50-1.60	9.2	0.4	28.7	- - -	- - -	- - -	37.0	15.6	A.D.B.
	9.2	- - -	28.8	- - -	- - -	- - -	37.0	15.6	D.B.
+1.60	63.0	0.4	67.7	- - -	- - -	- - -	100.0	48.4	A.D.B.
	63.0	- - -	68.0	- - -	- - -	- - -	100.0	43.8	D.B.

COMPOSITE ¼" x 65 m FLOATS @ 1.50 S.G., A.D.B.						
F.S.I.	F % on Coal	DILATATION TESTS				
		Softening Temp. (°C)	Max. Dil. Temp. (°C)	Maximum Contr. %	Maximum Dil. %	G.No.
9	0.103					

Warnock Hersey Professional Services Ltd.

ELCO MINING LTD. CORE SAMPLE ANALYSIS

Hole No.: DH 22 - 7 Lab. No.: 77 - 3048 Date: March 25, 1977

HEAD RAW ANALYSIS						
R.M.%	Ash%	V.M.%	F.C %	S.%	H.G.I.	REMARKS
0.4	30.6	15.3	53.7	0.54	85.8	Air Dried Basis
- - -	30.8	15.4	53.8	0.54	- - -	Dry Basis

SIZE / RAW ANALYSES								
Size Fraction	Wt. %	R.M.%	Ash %	S. %	CUMULATIVE			
					Wt. %	Ash %	S. %	
¼ x 65	87.5	0.4	30.7	0.54	87.5	30.7	0.54	A.D.B.
	87.5	- - -	30.8	0.54	87.5	30.8	0.54	D.B.
65 x 0	12.5	0.6	22.8	0.62	100.0	29.7	0.55	A.D.B.
	12.5	- - -	22.9	0.62	100.0	29.8	0.55	D.B.

SINK - FLOAT ANALYSIS: ¼" x 65 M									
S. G.	Wt.%	R.M%	Ash %	V.M%	F.C%	S.%	Cumulative		
							Wt. %	Ash %	
-1.40	45.7	0.4	7.1	19.8	72.7	0.69	45.7	7.1	A.D.B.
	45.7	- - -	7.2	19.8	73.0	0.69	45.7	7.2	D.B.
1.40-1.50	12.5	0.4	16.2	17.7	65.7	0.56	58.2	9.0	A.D.B.
	12.5	- - -	16.3	17.7	66.0	0.56	58.2	9.1	D.B.
1.50-1.60	6.3	0.5	23.4	- - -	- - -	- - -	64.5	10.5	A.D.B.
	6.3	- - -	23.5	- - -	- - -	- - -	64.5	10.6	D.B.
+1.60	35.5	0.5	66.7	- - -	- - -	- - -	100.0	30.4	A.D.B.
	35.5	- - -	67.0	- - -	- - -	- - -	100.0	30.6	D.B.

COMPOSITE ¼" x 65 m FLOATS @ 1.50 S.G., A.D.B.						
F.S.I.	P % on Coal	DILATATION TESTS				
		Softening Temp.(°C)	Max. Dil. Temp.(°C)	Maximum Contr. %	Maximum Dil. %	G.No.
6	0.008					

Warnock Hersey Professional Services Ltd.

ELCO MINING LTD. CORE SAMPLE ANALYSIS

Hole No.: DH 22 - 8 Lab. No.: 77 - 3049 Date: March 25, 1977

HEAD RAW ANALYSIS						
R.M.%	Ash%	V.M.%	F.C %	S.%	H.G.I.	REMARKS
0.2	40.3	15.3	44.2	0.49	102.4	Air Dried Basis
- --	40.4	15.4	44.2	0.49	- - -	Dry Basis

SIZE / RAW ANALYSES								
Size Fraction	Wt. %	R.M.%	Ash %	S. %	CUMULATIVE			
					Wt. %	Ash %	S. %	
¼ x 65	85.3	0.4	41.2	0.50	85.3	41.2	0.50	A.D.B.
	85.3	- -	41.3	0.50	85.3	41.3	0.50	D.B.
65 x 0	14.7	0.7	26.7	0.65	100.0	39.1	0.52	A.D.B.
	14.7	- - -	26.9	0.65	100.0	39.2	0.52	D.B.

SINK - FLOAT ANALYSIS: ¼" x 65 M									
S. G.	Wt.%	R.M%	Ash %	V.M%	F.C%	S.%	Cumulative		
							Wt. %	Ash %	
-1.40	36.7	0.6	7.5	19.7	72.2	0.72	36.7	7.5	A.D.B.
	36.7	- - -	7.6	19.8	72.6	0.72	36.7	7.6	D.B.
1.40-1.50	9.2	0.6	14.0	18.9	66.4	0.61	45.9	8.8	A.D.B.
	9.2	- - -	14.1	19.0	66.9	0.61	45.9	8.9	D.B.
1.50-1.60	2.7	0.8	22.3	- - -	- - -	- - -	48.6	9.6	A.D.B.
	2.7	- --	22.5	- --	- - -	- - -	48.6	9.7	D.B.
+1.60	51.4	0.6	71.1	- - -	- - -	- - -	100.0	41.2	A.D.B.
	51.4	- - -	71.5	- - -	- - -	- - -	100.0	41.4	D.B.

COMPOSITE ¼" x 65 m FLOATS @ 1.50 S.G., A.D.B.						
F.S.I.	F % on Coal	DILATATION TESTS				
		Softening Temp.(°C)	Max. Dil. Temp.(°C)	Maximum Contr. %	Maximum Dil. %	G.No.
9	0.003					

Warnock Hersey Professional Services Ltd.

ELCO MINING LTD. CORE SAMPLE ANALYSIS

Hole No.: DH 22 - 9 Lab. No.: 77 - 3050 Date: March 28, 1977

HEAD RAW ANALYSIS						
R.M.%	Ash%	V.M.%	F.C.%	S.%	H.G.I.	REMARKS
0.4	25.4	16.1	58.1	0.38	98.2	Air Dried Basis
- -	25.5	16.1	58.4	0.38	- - -	Dry Basis

SIZE / RAW ANALYSES								
Size Fraction	Wt. %	R.M.%	Ash %	S. %	CUMULATIVE Wt. %	CUMULATIVE Ash %	CUMULATIVE S. %	
¼ x 65	87.9	0.6	26.1	0.39	87.9	26.1	0.39	A.D.B.
	87.9	- - -	26.2	0.39	87.9	26.2	0.39	D.B.
65 x 0	12.1	0.7	20.5	0.43	100.0	25.4	0.39	A.D.B.
	12.1	- -	20.6	0.43	100.0	25.5	0.39	D.B.

SINK - FLOAT ANALYSIS ¼" x 65 M									
S. G.	Wt.%	R.M%	Ash %	V.M%	F.C%	S.%	Cumulative Wt. %	Cumulative Ash %	
-1.40	55.9	0.8	5.7	19.5	74.0	0.37	55.9	5.7	A.D.B.
	55.9	- - -	5.7	19.6	74.7	0.37	55.9	5.7	D.B.
1.40-1.50	10.8	0.9	13.0	17.6	68.5	0.34	66.7	6.9	A.D.B.
	10.8	- - -	13.1	17.8	69.1	0.34	66.7	6.9	D.B.
1.50-1.60	3.2	0.8	21.7	- -	- -	- -	69.9	7.6	A.D.B.
	3.2	- - -	21.9	- -	- -	- - -	69.9	7.6	D.B.
+1.60	30.1	0.7	70.9	- -	- -	- -	100.0	26.6	A.D.B.
	30.1	- - -	71.4	- -	- -	- -	100.0	26.8	D.B.

COMPOSITE ¼" x 65 m FLOATS @ 1.50 S.G., A.D.B.						
F.S.I.	F % on Coal	DILATATION TESTS Softening Temp.(°C)	Max. Dil. Temp.(°C)	Maximum Contr. %	Maximum Dil. %	G.No.
4½	0.002					

CLIENT: WARNOCK HERSEY

PROJECT: DILATATION TESTS *

SAMPLE : -8 Mesh, 1.50 S.G. Floats Composite

DATE: March 30, 1977

Well No.	W.H. I.D. No.	INITIAL TEMP(°C)	SOFTENING TEMP(°C)	MAX. DILAT'N TEMP(°C)	MAX. CONTRACT'N %	MAX. DILATATION %	G.No.
DH 17-1	77-3036	320	417	---	20% @ 468°	---	---
DH 17-2	77-3037	320	406	482	30	3	0.935
DH 17-3	77-3038	320	396	475	22	56	1.041
DH 17-4	77-3039	320	396	468	26	59	1.033
DH 17-5	77-3040	320	385	478	27	145	1.080
DH 17-6	77-3041	320	385	475	22	120	1.078
DH 22-1	77-3042	320	403	---	17% @ 453°	---	---
DH 22-2	77-3043	320	429	---	22% @ 460°	---	---
DH 22-3	77-3044	320	410	---	18% @ 464°	---	---
DH 22-4	77-3045	320	421	---	20% @ 471°	---	---
DH 22-5	77-3046	320	410	---	15% @ 464°	---	---
DH 22-6	77-3047	320	392	468	24	69	1.045
DH 22-7	77-3048	320	410	---	21% @ 457°	---	---
DH 22 -8	77-3049	320	410	482	24	10	0.968
DH 22-9	77-3050	320	421	---	21% @ 468°	---	---
DH 28-1	77-3051	320	421	---	19% @ 468°	---	---
DH 28-2	77-3052	320	424	---	16% @ 468°	---	---
DH 28-3	77-3053	320	406	475	25	45	1.023
DH 28 -4	77-3054	320	414	---	14% @ 464°	---	---
DH 28 -5	77-3055	320	414	446	24	2	0.969
DH 28-6	77-3056	320	406	478	22	- 19	0.473
DH 29-8	77-3057	320	406	478	26	8	0.959
DH 29-9	77-3058	320	403	478	24	22	0.996

* Softening Temp., Maximum Dilatation/Contraction Temp. are corrected with factor = 6/5

ELCO MINING LTD.

CORE SAMPLE ANALYSIS

HOLE NO.: DH-22-10 Lab. No. 8679 DATE: March/77

HEAD RAW ANALYSIS						
R.M. %	ASH %	V.M. %	F.C. %	S. %	H.G.I.	REMARKS
0.5	13.9	17.4	68.2	0.58	138	Air Dried Basis
	14.0	17.5	68.5	0.58	---	Dry Basis

SIZE/RAW ANALYSES								
SIZE FRACTION	WT. %	R.M. %	ASH %	S. %	CUMULATIVE WT. %	CUMULATIVE ASH %	CUMULATIVE S. %	
1/4" x 65M	89.9	0.8	13.5	0.64	89.9	13.5	0.64	A.D.B.
	89.9		13.6	0.65	89.9	13.6	0.65	D.B.
65M x 0	10.1	0.8	15.5	0.54	100.0	13.7	0.63	A.D.B.
	10.1		15.6	0.54	100.0	13.8	0.64	D.B.

SINK-FLOAT ANALYSIS: 1/4" x 65M									
S. G.	WT. %	R.M. %	ASH %	V.M. %	F.C. %	S. %	CUMULATIVE WT. %	CUMULATIVE ASH %	
-1.40	72.0	0.8	4.6	19.9	74.7	0.74	72.0	4.6	A.D.B.
	72.0		4.6	20.1	75.3	0.75	72.0	4.6	D.B.
1.40-1.50	10.2	0.8	16.4	17.1	65.7	0.73	82.2	6.1	A.D.B.
	10.2		16.5	17.2	66.3	0.74	82.2	6.1	D.B.
1.50-1.60	5.7	0.8	25.6				87.9	7.3	A.D.B.
	5.7		25.8				87.9	7.4	D.B.
+1.60	12.1	1.0	62.2				100.0	14.0	A.D.B.
	12.1		62.8				100.0	14.1	D.B.

COMPOSITE 1/4" x 65M FLOATS @ 1.50 S.G., A.D.B.						
F.S.I.	P% ON COAL	DILATATION TEST(Starting Temp.=320°C) SOFTENING TEMP. *(°C)	MAX. DIL. TEMP.* (°C)	MAXIMUM CONTR. %	MAXIMUM DIL. %	G. NO.
9	0.24	410	480	24	33	1.013

* S.T. & M.D.T. corrected with factor 6/5

Birtley Engineering

Subsidiary of Great West Steel Industries

Lab. No. 8679 Date March 30, 1977

Client: ELCO MINING LTD.

Sample Identification: DH-22-10

Starting Temperature °C: 320

Softening Temperature °C: 410

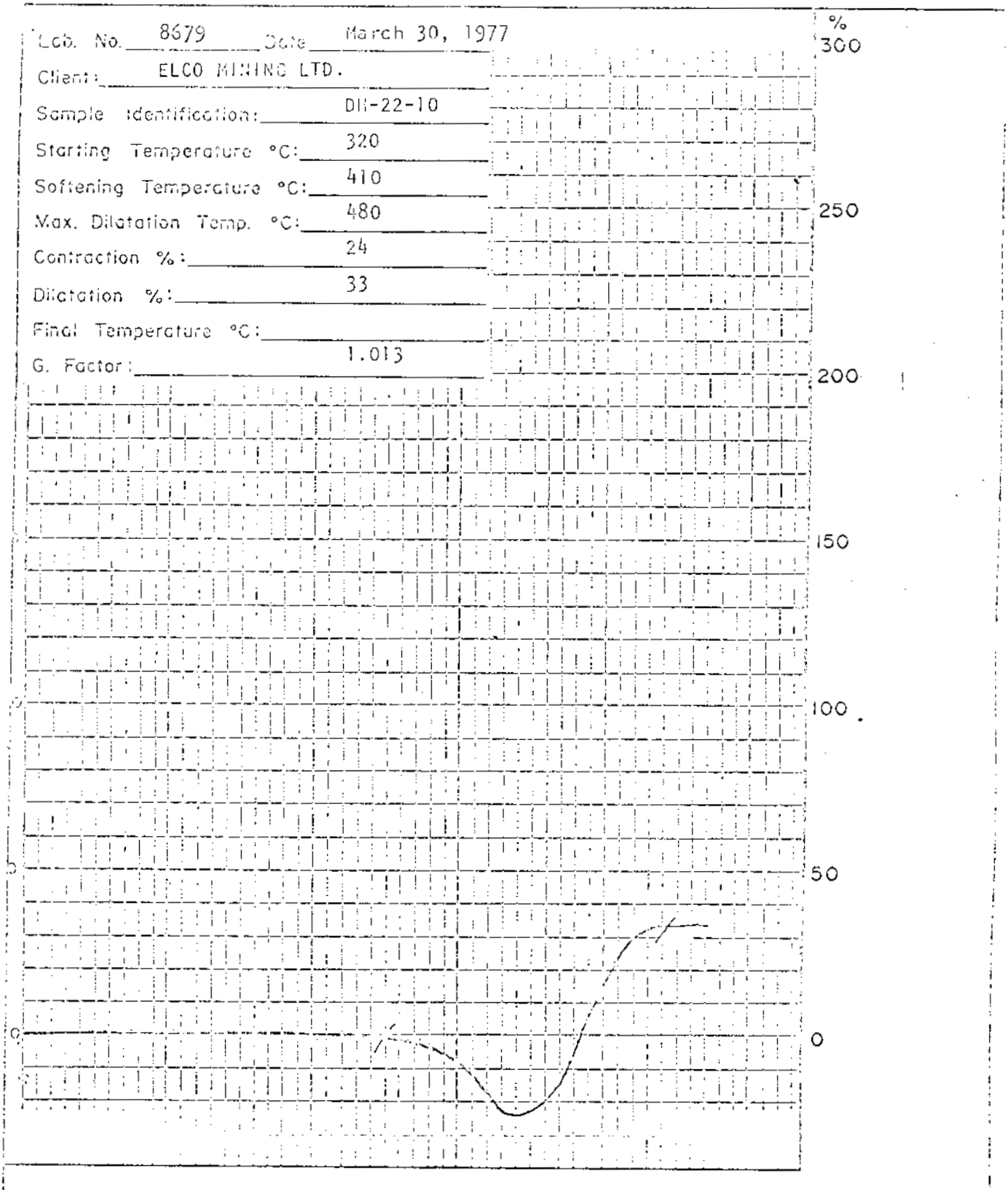
Max. Dilatation Temp. °C: 480

Contraction %: 24

Dilatation %: 33

Final Temperature °C:

G. Factor: 1.013



BIRTLEY ENGINEERING (CANADA) LTD.

Title

RUHR DILATOMETER TEST

Date

Drawn

ELCO MINING LTD.

CORE SAMPLE ANALYSIS

HOLE NO.: DH-22-11 Lab. No.8680 DATE: March/77

HEAD RAW ANALYSIS						
R.M. %	ASH %	V.M. %	F.C. %	S. %	H.G.I.	REMARKS
0.6	28.8	16.1	54.5	0.68	88	Air Dried Basis
	29.0	16.2	54.8	0.68	--	Dry Basis

SIZE/RAW ANALYSES								
SIZE FRACTION	WT. %	R.M. %	ASH %	S. %	CUMULATIVE WT. %	CUMULATIVE ASH %	CUMULATIVE S. %	
1/4" x 65M	81.7	0.6	30.7	0.70	81.7	30.7	0.70	A.D.B.
	81.7		30.9	0.70	81.7	30.9	0.70	D.B.
65M x 0	18.3	0.7	22.5	0.54	100.0	29.2	0.67	A.D.B.
	18.3		22.7	0.54	100.0	29.4	0.67	D.B.

SINK-FLOAT ANALYSIS: 1/4" x 65M									
S. G.	WT. %	R.M. %	ASH %	V.M. %	F.C. %	S. %	CUMULATIVE WT. %	CUMULATIVE ASH %	
-1.40	50.4	0.6	7.0	19.4	73.0	0.55	50.4	7.0	A.D.B.
	50.5		7.0	19.5	73.5	0.55	50.5	7.0	D.B.
1.40-1.50	14.3	0.8	17.2	16.8	65.2	0.46	64.7	9.3	A.D.B.
	14.3		17.3	16.9	65.8	0.46	64.8	9.3	D.B.
1.50-1.60	4.5	1.0	24.5				69.2	10.2	A.D.B.
	4.5		24.7				69.3	10.3	D.B.
+1.60	30.8	1.0	74.2				100.0	29.9	A.D.B.
	30.7		74.9				100.0	30.1	D.B.

COMPOSITE 1/4" x 65M FLOATS @ 1.50 S.G., A.D.B.						
F.S.I.	P% ON COAL	DILATATION TEST (Starting Temp.=320°C) SOFTENING TEMP.*(°C)	MAX. DIL. TEMP.*(°C)	MAXIMUM CONTR. %	MAXIMUM DIL. %	G. NO.
9	0.01	392	475	25	44	1.027

* S.T. & M.D.T. corrected with factor 6/5

Birtley Engineering

Subsidiary of Great West Steel Industries

Lab. No. 8680 Date March 31, 1977

Client: ELCO MINING LTD.

Sample Identification: DH-22-11

Starting Temperature °C: 320

Softening Temperature °C: 392

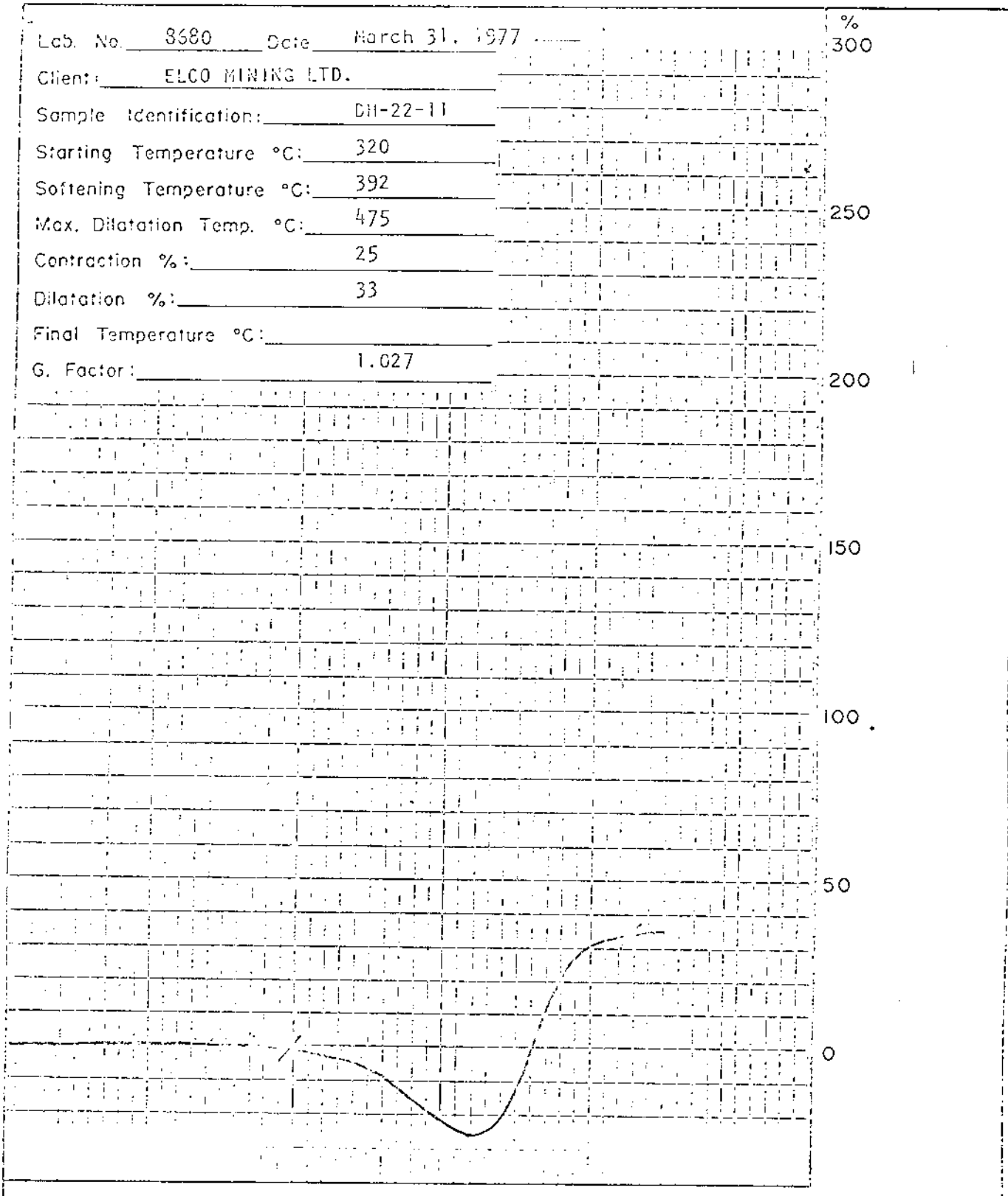
Max. Dilatation Temp. °C: 475

Contraction %: 25

Dilatation %: 33

Final Temperature °C:

G. Factor: 1.027



BARTLEY ENGINEERING (CANADA) LTD.

Title

RUHR DILATOMETER TEST

Date

Drawn

Warnock Hersey Professional Services Ltd.

ELCO MINING LTD. CORE SAMPLE ANALYSIS

Hole No.: DH 23 - 1 Lab. No.: 77 - 2008 Date: February 24, 1977

HEAD RAW ANALYSIS						
R.M.%	Ash%	V.M.%	F.C.%	S.%	H.G.I.	REMARKS
0.7	20.2	19.1	60.0	0.47	91.3	Air Dried Basis
- - -	20.3	19.2	60.5	0.47	- - -	Dry Basis

SIZE / RAW ANALYSES								
Size Fraction	Wt. %	R.M.%	Ash %	S. %	CUMULATIVE			
					Wt. %	Ash %	S. %	
¼" x 65m	91.0	0.8	20.5	0.44	91.0	20.5	0.44	A.D.B.
	91.0	- - -	20.6	0.44	91.0	20.6	0.44	D.B.
65m x 0	9.0	0.8	23.5	0.52	100.0	20.8	0.45	A.D.B.
	9.0	- - -	23.6	0.52	100.0	20.9	0.45	D.B.

SINK - FLOAT ANALYSIS: ¼" x 65 M									
S. G.	Wt.%	R.M%	Ash %	V.M%	F.C%	S.%	Cumulative		
							Wt. %	Ash %	
-1.40	64.4	0.6	4.6	22.4	62.6	0.46	64.4	4.6	A.D.B.
	64.4	- - -	4.6	22.6	63.0	0.46	64.4	4.6	D.B.
1.40-1.50	7.6	0.8	18.6	18.7	61.9	0.45	72.0	6.1	A.D.B.
	7.6	- - -	18.8	18.8	62.4	0.45	72.0	6.1	D.B.
1.50-1.60	4.5	0.8	26.7	- - -	- - -	- - -	76.5	7.3	A.D.B.
	4.5	- - -	26.9	- - -	- - -	- - -	76.5	7.3	D.B.
+1.60	23.5	1.0	65.6	- - -	- - -	- - -	100.0	21.0	A.D.B.
	23.5	- - -	66.3	- - -	- - -	- - -	100.0	21.2	D.B.

COMPOSITE ¼" x 0 m FLOATS @ 1.50 S.G., A.D.B.						
F.S.I.	F % on Coal	DILATATION TESTS				
		Softening Temp.(°C)	Max. Dil. Temp.(°C)	Maximum Contr. %	Maximum Dil. %	G.No.
7	0.012					

Lab. No. 8582 Date March/77

Client: Warnock Hersey

Sample Identification: 77-2008

Starting Temperature °C: 350

Softening Temperature °C: 398

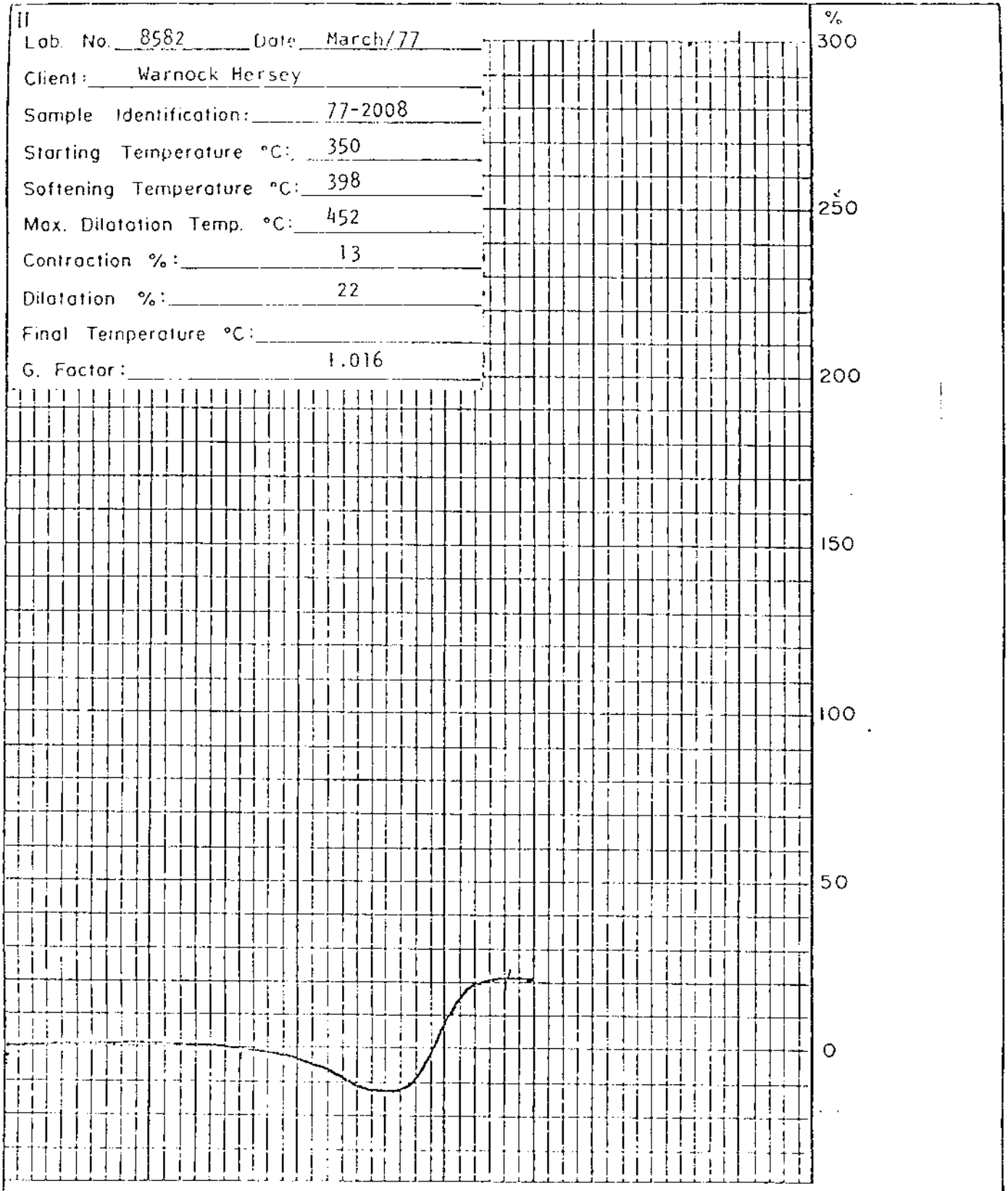
Max. Dilatation Temp. °C: 452

Contraction %: 13

Dilatation %: 22

Final Temperature °C:

G. Factor: 1.016



BIRTLEY ENGINEERING (CANADA) LTD.

Title	Date
RUHR DILATOMETER TEST	
	Drawn

Warnock Hersey Professional Services Ltd.

ELCO MINING LTD. CORE SAMPLE ANALYSIS

Hole No.: DH 23 - 2 Lab. No.: 77 - 2009 Date: February 24, 1977

HEAD RAW ANALYSIS						
R.M.%	Ash%	V.M.%	F.C %	S.%	H.G.I.	REMARKS
0.4	29.9	15.8	53.9	0.60	74.0	Air Dried Basis
- - -	30.0	15.8	54.2	0.60	- - -	Dry Basis

SIZE / RAW ANALYSES								
Size Fraction	Wt. %	R.M.%	Ash %	S. %	CUMULATIVE			
					Wt. %	Ash %	S. %	
¼" x 65m	93.8	0.6	31.1	0.63	93.8	31.1	0.63	A.D.B.
	93.8	- - -	31.3	0.63	93.8	31.3	0.63	D.B.
65m x 0	6.2	0.7	21.1	0.83	100.0	30.5	0.64	A.D.B.
	6.2	- - -	21.3	0.84	100.0	30.7	0.64	D.B.

SINK - FLOAT ANALYSIS: ¼" x 65 M									
S. G.	Wt.%	R.M%	Ash %	V.M%	F.C%	S.%	Cumulative		
							Wt. %	Ash %	
-1.40	51.3	0.4	7.6	19.6	72.4	0.70	51.3	7.6	A.D.B.
	51.3	- - -	7.7	19.7	72.6	0.70	51.3	7.7	D.B.
1.40-1.50	12.0	0.5	19.8	17.4	62.3	0.68	63.3	9.9	A.D.B.
	12.0	- - -	19.9	17.5	62.6	0.68	63.3	10.0	D.B.
1.50-1.60	5.0	0.5	28.3	- - -	- - -	- - -	68.3	11.3	A.D.B.
	5.0	- - -	28.4	- - -	- - -	- - -	68.3	11.4	D.B.
+1.60	31.7	0.8	74.4	- - -	- - -	- - -	100.0	31.3	A.D.B.
	31.7	- - -	75.0	- - -	- - -	- - -	100.0	31.5	D.B.

COMPOSITE ¼" x 65 m FLOATS @ 1.50 S.G., A.D.B.						
F.S.I.	P % on Coal	DILATATION TESTS				
		Softening Temp.(°C)	Max. Dil. Temp.(°C)	Maximum Contr. %	Maximum Dil. %	G.No.
8	0.023					

Lot No. 8583 Date March/77

Client: Warnock Hersey

Sample Identification: 77-2009

Starting Temperature °C: 350

Softening Temperature °C: 407

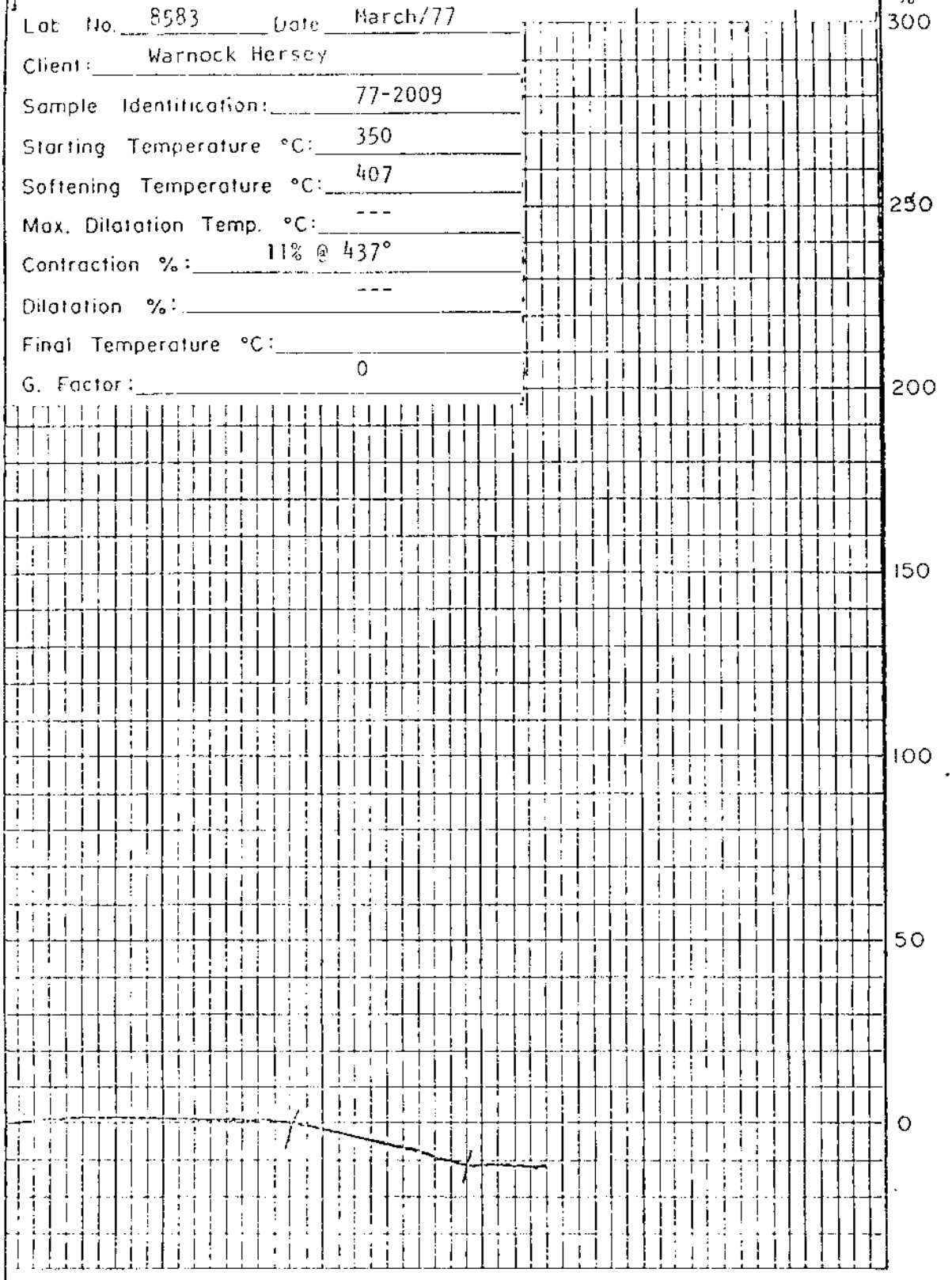
Max. Dilatation Temp. °C: ---

Contraction %: 11% @ 437°

Dilatation %: ---

Final Temperature °C:

G. Factor: 0



BIRTLEY ENGINEERING (CANADA) LTD.

Title	Date
RUHR DILATOMETER TEST	
	Drawn

Warnock Hersey Professional Services Ltd.

ELCO MINING LTD. CORE SAMPLE ANALYSIS

Hole No.: DH 23 - 3 Lab. No.: 77 - 2010 Date: February 28, 1977

HEAD RAW ANALYSIS						
R.M.%	Ash%	V.M.%	F.C.%	S.%	H.G.I.	REMARKS
0.4	13.2	19.7	66.7	0.83	89.2	Air Dried Basis
- - -	13.2	19.8	67.0	0.83	- - -	Dry Basis

SIZE / RAW ANALYSES								
Size Fraction	Wt. %	R.M.%	Ash %	S. %	CUMULATIVE			
					Wt. %	Ash %	S. %	
¼" x 65m	90.4	0.5	11.9	0.86	90.4	11.9	0.86	A.D.B.
	90.4	- - -	12.0	0.86	90.4	12.0	0.86	D.B.
65m x 0	9.6	0.6	16.0	1.28	100.0	12.3	0.90	A.D.B.
	9.6	- - -	16.1	1.29	100.0	12.4	0.90	D.B.

SINK - FLOAT ANALYSIS: ¼" x 65 M									
S. G.	Wt.%	R.M%	Ash %	V.M%	F.C%	S.%	Cumulative		
							Wt. %	Ash %	
-1.40	81.3	0.4	4.4	21.2	74.0	0.89	81.3	4.4	A.D.B.
	81.3	- - -	4.5	21.2	74.3	0.89	81.3	4.5	D.B.
1.40-1.50	5.8	0.5	17.7	19.3	62.5	0.69	87.1	5.3	A.D.B.
	5.8	- - -	17.8	19.4	62.8	0.69	87.1	5.4	D.B.
1.50-1.60	2.8	0.5	26.2	- - -	- - -	- - -	89.9	5.9	A.D.B.
	2.8	- - -	26.3	- - -	- - -	- - -	89.9	6.0	D.B.
+1.60	10.1	0.7	62.5	- - -	- - -	- - -	100.0	11.6	A.D.B.
	10.1	- - -	62.9	- - -	- - -	- - -	100.0	11.8	D.B.

COMPOSITE ¼" x 65 m FLOATS @ 1.50 S.G., A.D.B.						
F.S.I.	P % on Coal	DILATATION TESTS				
		Softening Temp. (°C)	Max. Dil. Temp. (°C)	Maximum Contr. %	Maximum Dil. %	G.No.
7	0.019					

Lab. No. 8584 Date March/77

Client: Warnock Hersey

Sample Identification: 77-2010

Starting Temperature °C: 350

Softening Temperature °C: 389

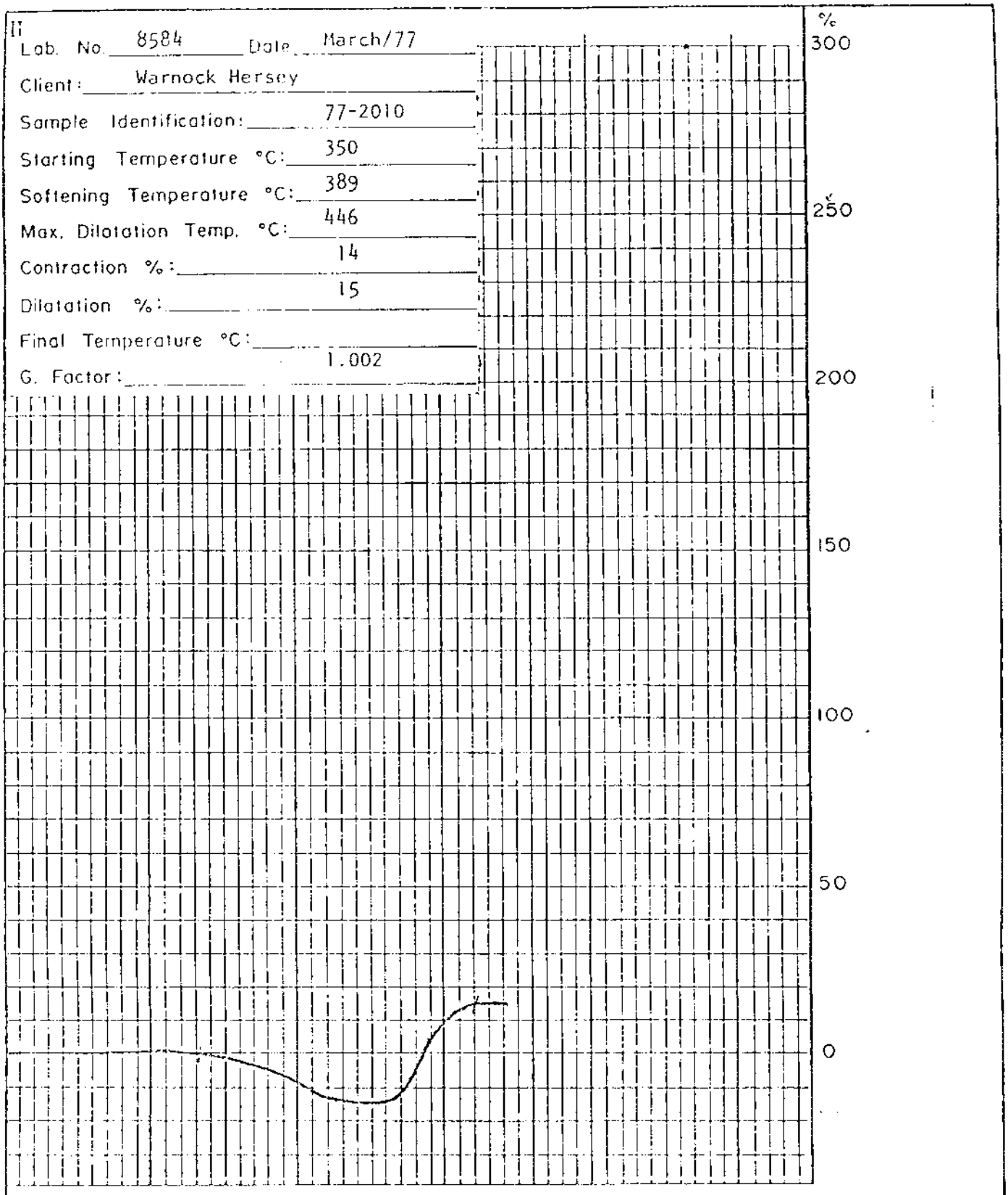
Max. Dilatation Temp. °C: 446

Contraction %: 14

Dilatation %: 15

Final Temperature °C:

G. Factor: 1.002



BIRTLEY ENGINEERING (CANADA) LTD.

Title

RUHR DILATOMETER TEST

Date

Drawn

Warnock Hersey Professional Services Ltd.

ELCO MINING LTD. CORE SAMPLE ANALYSIS

Hole No.: DH 23 - 4 Lab. No.: 77 - 2011 Date: February 24, 1977

HEAD RAW ANALYSIS						
R.M.%	Ash%	V.M.%	F.C.%	S.%	H.G.I.	REMARKS
0.5	31.3	16.7	51.5	0.39	75.9	Air Dried Basis
- - -	31.5	16.8	51.7	0.39	- - -	Dry Basis

SIZE / RAW ANALYSES								
Size Fraction	Wt. %	R.M.%	Ash %	S. %	CUMULATIVE			
					Wt. %	Ash %	S. %	
¼" x 65m	90.5	0.7	33.3	0.35	90.5	33.3	0.35	A.D.B.
	90.5	- - -	33.5	0.35	90.5	33.5	0.35	D.B.
65m x 0	9.5	0.8	25.5	0.49	100.0	32.6	0.36	A.D.B.
	9.5	- - -	25.6	0.49	100.0	32 7	0.36	D.B.

SINK - FLOAT ANALYSIS: ¼" x 65 M									
S. G.	Wt.%	R.M%	Ash %	V.M%	F.C%	S.%	Cumulative		
							Wt. %	Ash %	
-1.40	48.6	0.4	4.6	20.6	74.4	0.43	48.6	4.6	A.D.B.
	48.7	- - -	4.6	20.7	74.7	0.43	48.7	4.6	D.B.
1.40-1.50	8.1	0.6	17.2	18.0	64.2	0.40	56.7	6.4	A.D.B.
	8.1	- - -	17.3	18.1	64.6	0.40	56.8	6.4	D.B.
1.50-1.60	3.7	0.6	26.7	- - -	- - -	- - -	60.4	7.6	A.D.B.
	3.7	- - -	26.9	- - -	- - -	- - -	60.5	7.7	D.B.
+1.60	39.6	1.0	75.2	- - -	- - -	- - -	100.0	34.4	A.D.B.
	39.5	- - -	76.0	- - -	- - -	- - -	100.0	34.7	D.B.

COMPOSITE ¼" x 65 m FLOATS @ 1.50 S.G., A.D.B.						
F.S.I.	P % on Coal	DILATATION TESTS				
		Softening Temp. (°C)	Max. Dil. Temp. (°C)	Maximum Contr. %	Maximum Dil. %	G.No.
6	0.014					

Lab No. 8585 Date March/77

Client: Warnock Hersey

Sample Identification: 77-2011

Starting Temperature °C: 350

Softening Temperature °C: 404

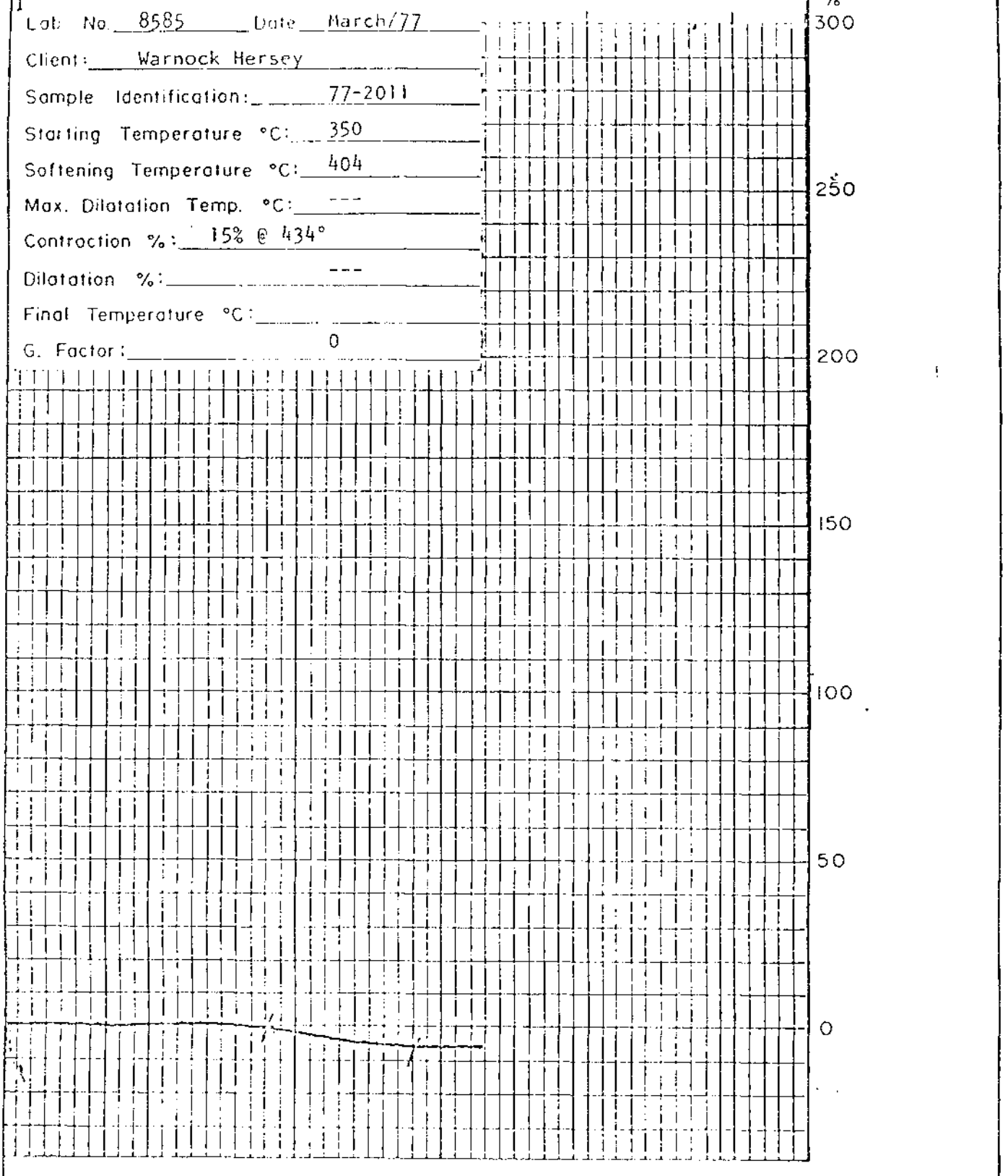
Max. Dilatation Temp. °C: ---

Contraction %: 15% @ 434°

Dilatation %: ---

Final Temperature °C:

G. Factor: 0



BIRTLEY ENGINEERING (CANADA) LTD.

Title	Date
RUHR DILATOMETER TEST	
	Drawn

Warnock Hersey Professional Services Ltd.

ELCO MINING LTD. CORE SAMPLE ANALYSIS

Hole No.: DH 23 - 5 Lab. No.: 77 - 2012 Date: February 24, 1977

HEAD RAW ANALYSIS						
R.M.%	Ash%	V.M.%	F.C %	S.%	H.G.I.	REMARKS
0.6	16.3	18.1	65.0	0.47	110.0	Air Dried Basis
- - -	16.4	18.2	65.4	0.47	- - -	Dry Basis

SIZE / RAW ANALYSES								
Size Fraction	Wt. %	R.M.%	Ash %	S. %	CUMULATIVE			
					Wt. %	Ash %	S. %	
¼" x 65m	89.7	0.6	16.8	0.43	89.7	16.8	0.43	A.D.B.
	89.7	- - -	16.9	0.43	89.7	16.9	0.43	D.B.
65 m x 0	10.3	0.7	14.8	0.60	100.0	16.6	0.45	A.D.B.
	10.3	- - -	14.9	0.60	100.0	16.7	0.45	D.B.

SINK - FLOAT ANALYSIS: ¼" x 65 M									
S. G.	Wt.%	R.M%	Ash %	V.M%	F.C%	S.%	Cumulative		
							Wt. %	Ash %	
-1.40	69.3	0.9	4.7	20.4	74.0	0.47	69.3	4.7	A.D.B.
	69.3	- --	4.7	20.6	74.7	0.47	69.3	4.7	D.B.
1.40-1.50	7.8	0.8	16.9	17.4	64.9	0.42	77.1	5.9	A.D.B.
	7.8	- -	17.0	17.6	65.4	0.42	77.1	5.9	D.B.
1.50-1.60	5.6	1.1	24.7	- - -	- - -	- - -	82.7	7.2	A.D.B.
	5.6	- - -	25.0	- - -	- - -	- - -	82.7	7.2	D.B.
+1.60	17.3	1.1	57.4	- - -	- --	- - -	100.0	15.9	A.D.B.
	17.3	- - -	58.0	- - -	- - -	- - -	100.0	16.0	D.B.

COMPOSITE ¼" x 65 m FLOATS @ 1.50 S.G., A.D.B.						
F.S.I.	F % on Coal	DILATATION TESTS				
		Softening Temp. (°C)	Max. Dil. Temp. (°C)	Maximum Contr. %	Maximum Dil. %	G.No.
5½	0.036					

Lab No. 8586 Date March/77

Client: Warnock Hersey

Sample Identification: 77-2012

Starting Temperature °C: 350

Softening Temperature °C: 404

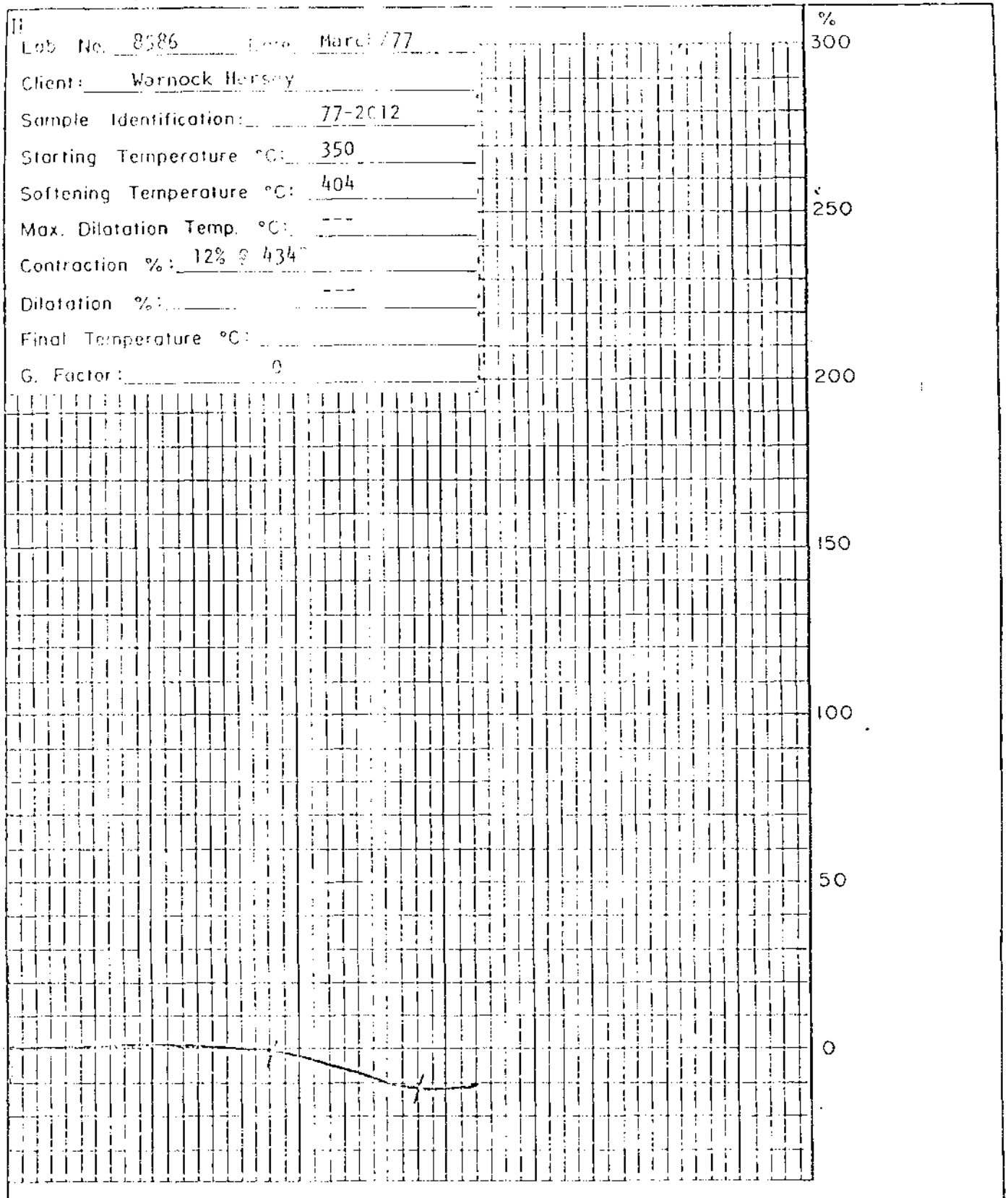
Max. Dilatation Temp. °C: ---

Contraction %: 12% @ 434°

Dilatation %: ---

Final Temperature °C:

G. Factor: 0



BIRTLEY ENGINEERING (CANADA) LTD.

Title	Date
RUHR DILATOMETER TEST	
	Drawn

Warnock Hersey Professional Services Ltd.

ELCO MINING LTD. CORE SAMPLE ANALYSIS

Hole No.: DH 23 - 6 Lab. No.: 77 - 2013 Date: February 24, 1977

HEAD RAW ANALYSIS						
R.M.%	Ash%	V.M.%	F.C %	S.%	H.G.I.	REMARKS
0.5	19.8	17.4	62.3	0.41	90.6	Air Dried Basis
- - -	19.9	17.5	62.6	0.41	- - -	Dry Basis

SIZE / RAW ANALYSES								
Size Fraction	Wt. %	R.M.%	Ash %	S. %	CUMULATIVE			
					Wt. %	Ash %	S. %	
¼" x 65m	91.0	0.5	20.0	0.44	91.0	20.0	0.44	A.D.B.
	91.0	- - -	20.1	0.44	91.0	20.1	0.44	D.B.
65m x 0	9.0	0.7	15.3	0.55	100.0	19.6	0.45	A.D.B.
	9.0	- - -	15.4	0.55	100.0	19.7	0.45	D.B.

SINK - FLOAT ANALYSIS: ¼" x 65 M									
S. G.	Wt.%	R.M%	Ash %	V.M%	F.C%	S.%	Cumulative		
							Wt. %	Ash %	
-1.40	64.6	0.4	5.4	19.5	74.7	0.55	64.6	5.4	A.D.B.
	64.6	- - -	5.4	19.6	75.0	0.55	64.6	5.4	D.B.
1.40-1.50	8.1	0.6	18.1	17.6	63.7	0.41	72.7	6.8	A.D.B.
	8.1	- -	18.2	17.8	64.0	0.41	72.7	6.8	D.B.
1.50-1.60	6.6	0.6	28.8	- - -	- - -	- - -	79.3	8.6	A.D.B.
	6.6	- - -	29.0	- - -	- - -	- - -	79.3	8.7	D.B.
+1.60	20.7	0.8	62.8	- - -	- - -	- - -	100.0	19.8	A.D.B.
	20.7	- - -	63.4	- - -	- - -	- - -	100.0	20.0	D.B.

COMPOSITE ¼" x 65 m FLOATS @ 1.50 S.G., A.D.B.						
F.S.I.	P % on Coal	DILATATION TESTS				
		Softening Temp. (°C)	Max. Dil. Temp. (°C)	Maximum Contr. %	Maximum Dil. %	G.No.
6	0.016					

Lab. No. 8587 Date March/77

Client: Warnock Hersey

Sample Identification: 77-2013

Starting Temperature °C: 350

Softening Temperature °C: 404

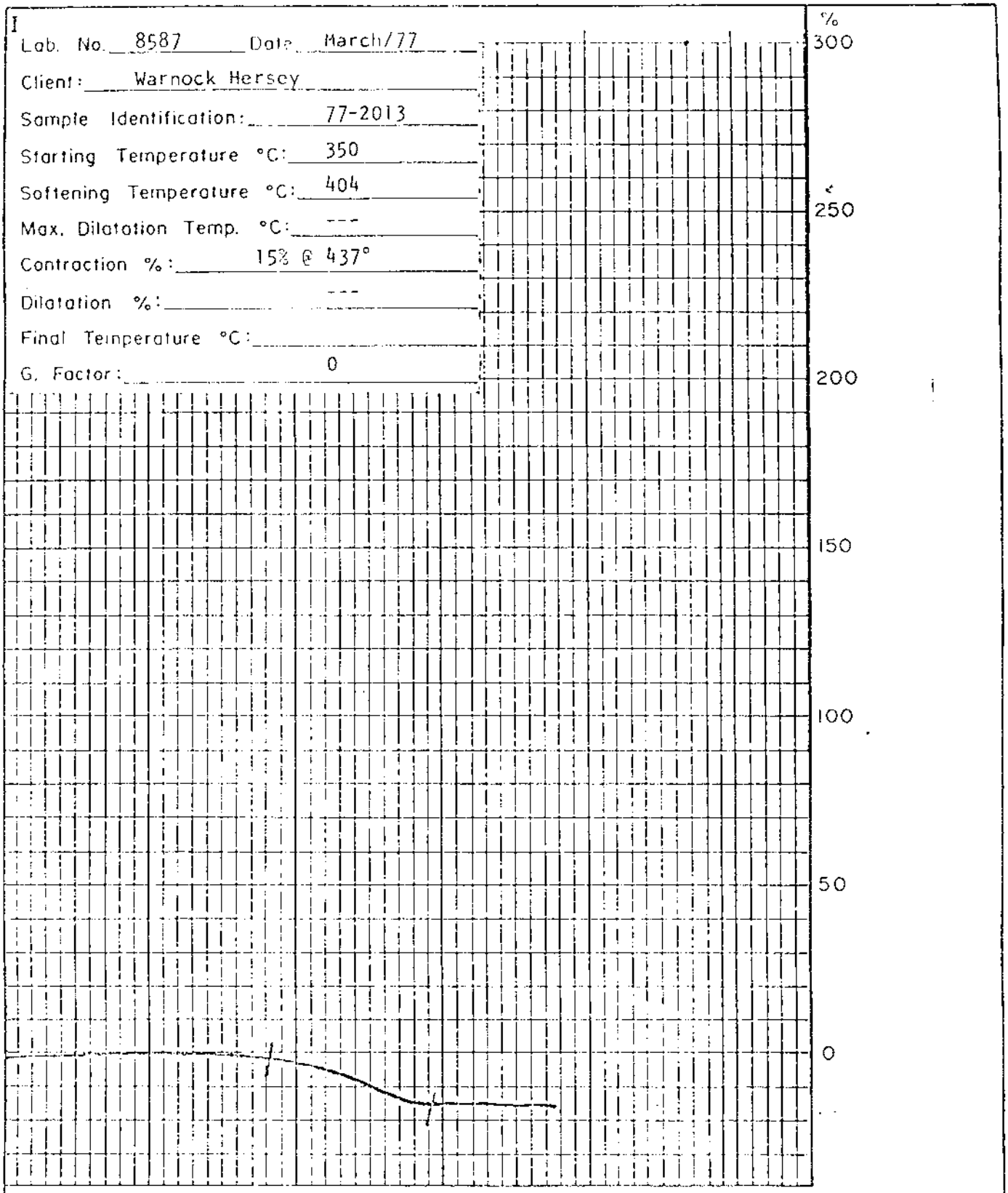
Max. Dilatation Temp. °C: ---

Contraction %: 15% @ 437°

Dilatation %: ---

Final Temperature °C:

G. Factor: 0



BIRTLEY ENGINEERING (CANADA) LTD.

Title	Date
RUHR DILATOMETER TEST	
	Drawn

Warnock Hersey Professional Services Ltd.

ELCO MINING LTD. CORE SAMPLE ANALYSIS

Hole No.: DH 23 - 7 Lab. No.: 77 - 2014 Date: February 25, 1977

HEAD RAW ANALYSIS						
R.M.%	Ash%	V.M.%	F.C %	S.%	F.G.I.	REMARKS
0.4	19.3	18.0	62.3	0.50	103.1	Air Dried Basis
- - -	19.4	18.0	62.6	0.50	- - --	Dry Basis

SIZE / RAW ANALYSES								
Size Fraction	Wt. %	R.M.%	Ash %	S. %	CUMULATIVE Wt. %	CUMULATIVE Ash %	CUMULATIVE S. %	
¼" x 65 m	88.0	0.4	19.4	0.45	88.0	19.4	0.45	A.D.B.
	88.0	- - -	19.5	0.45	88.0	19.5	0.45	D.B.
65m x 0	12.0	0.7	15.6	0.51	100.0	18.9	0.46	A.D.B.
	12.0	- - -	15.8	0.51	100.0	19.0	0.46	D.B.

SINK - FLOAT ANALYSIS: ¼" x 65 M									
S. G.	Wt.%	R.M%	Ash %	V.M%	F.C%	S.%	Cumulative Wt. %	Cumulative Ash %	
-1.40	64.7	0.7	5.5	20.2	73.6	0.52	64.7	5.5	A.D.B.
	64.7	- - -	5.5	20.4	74.1	0.52	64.7	5.5	D.B.
1.40-1.50	9.0	0.7	19.5	17.8	62.0	0.43	73.7	7.2	A.D.B.
	9.0	- - -	19.7	17.9	62 4	0.43	73.7	7.2	D.B.
1.50-1.60	8.4	0.6	29.4	- - -	- - -	- - -	82.1	9.5	A.D.B.
	8.4	- - -	29.6	- - -	- - -	- - -	82.1	9.5	D.B.
+1.60	17.9	0.9	63.0	- - -	- - -	- - -	100.0	19.1	A.D.B.
	17.9	- - -	63.6	- - -	- - -	- - -	100.0	19.2	D.B.

COMPOSITE ¼" x 65 m FLOATS @ 1.60 S.G., A.D.B.							
F.S.I.	F % on Coal	DILATATION TESTS Softening Temp.(°C)	Max. Dil. Temp.(°C)	Maximum Contr. %	Maximum Dil. %	G.No.	
6½	0.022						

Lab. No 8588 Date March/77

Client: Warnock Hersey

Sample Identification: 77-2014

Starting Temperature °C: 350

Softening Temperature °C: 401

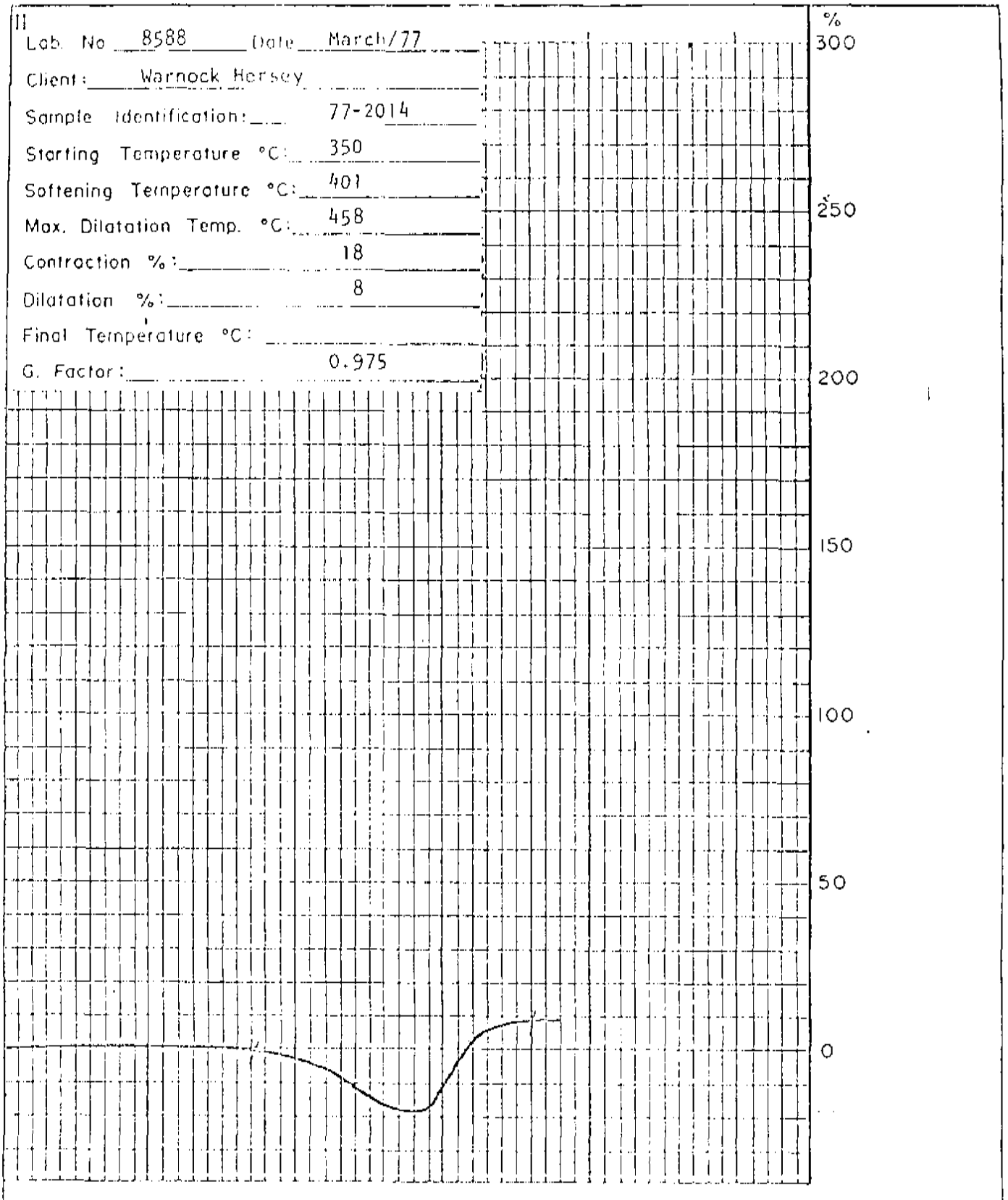
Max. Dilatation Temp. °C: 458

Contraction %: 18

Dilatation %: 8

Final Temperature °C:

G. Factor: 0.975



BIRTLEY ENGINEERING (CANADA) LTD.

Title

RUHR DILATOMETER TEST

Date

Drawn

Warnock Hersey Professional Services Ltd.

ELCO MINING LTD. CORE SAMPLE ANALYSIS

Hole No.: DH 23 - 8 Lab. No.: 77 - 2015 Date: February 25, 1977

HEAD RAW ANALYSIS						
R.M.%	Ash%	V.M.%	F.C %	S.%	H.G.I.	REMARKS
0.4	28.0	15.9	55.7	0.42	85.1	Air Dried Basis
- - -	28.1	15.9	56.0	0.42	- - -	Dry Basis

SIZE / RAW ANALYSES								
Size Fraction	Wt. %	R.M.%	Ash %	S. %	CUMULATIVE			
					Wt. %	Ash %	S. %	
¼" x 65m	90.7	0.5	28.7	0.42	90.7	28.7	0.42	A.D.B.
	90.7	- - -	28.8	0.42	90.7	28.8	0.42	D.B.
65m x 0	9.3	0.7	21.7	0.55	100.0	28.0	0.43	A.D.B.
	9.3	- - -	21.8	0.55	100.0	28.1	0.43	D.B.

SINK - FLOAT ANALYSIS: ¼" x 65 M									
S. G.	Wt.%	R.M%	Ash %	V.M%	F.C%	S.%	Cumulative		
							Wt. %	Ash %	
-1.40	57.9	0.4	5.4	19.1	75.1	0.56	57.9	5.4	A.D.B.
	58.0	- - -	5.4	19.1	75.5	0.56	58.0	5.4	D.B.
1.40-1.50	7.2	0.5	17.7	17.2	64.6	0.45	65.1	6.8	A.D.B.
	7.2	- - -	17.8	17.3	64.9	0.45	65.2	6.8	D.B.
1.50-1.60	2.8	0.5	28.4	- - -	- - -	- - -	67.9	7.6	A.D.B.
	2.8	- - -	28.5	- - -	- - -	- - -	68.0	7.7	D.B.
+1.60	32.1	0.9	74.5	- - -	- - -	- - -	100.0	29.1	A.D.B.
	32.0	- - -	75.2	- - -	- - -	- - -	100.0	29.3	D.B.

COMPOSITE ¼" x 65 m FLOATS @ 1.50 S.G., A.D.B.							
F.S.I.	P % on Coal	DILATATION TESTS					
		Softening Temp. (°C)	Max. Dil. Temp. (°C)	Maximum Contr. %	Maximum Dil. %	G.No.	
4½	0.034						

Lab. No. 8589 Date March 3/77

Client: Warnock Hersey

Sample Identification: 77-2015

Starting Temperature °C: 350

Softening Temperature °C: 407

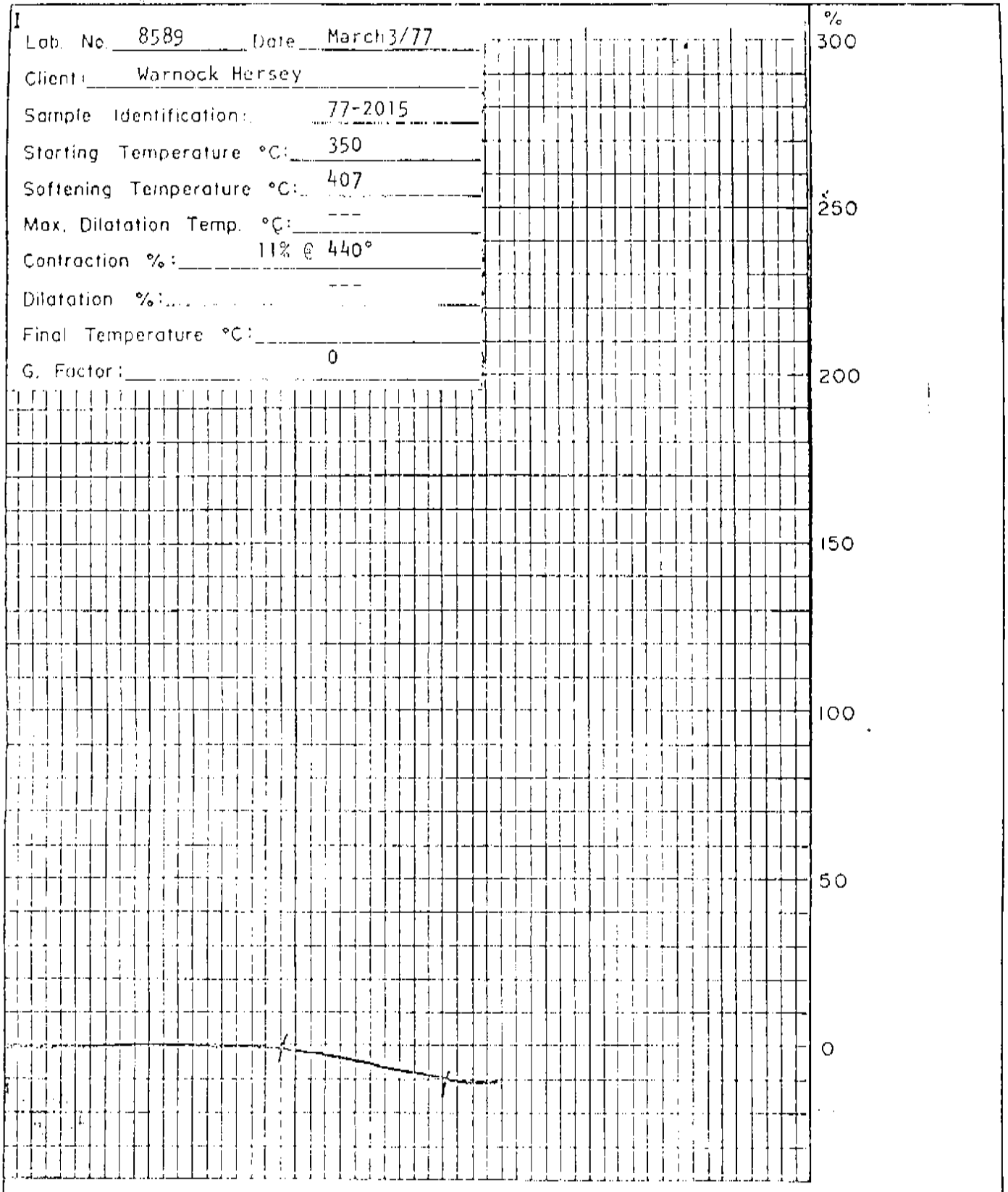
Max. Dilatation Temp. °C: ---

Contraction %: 11% @ 440°

Dilatation %: ---

Final Temperature °C:

G. Factor: 0



BIRTLEY ENGINEERING (CANADA) LTD.

Title	Date
RUHR DILATOMETER TEST	
	Drawn

Warnock Hersey Professional Services Ltd.

ELCO MINING LTD. CORE SAMPLE ANALYSIS

Hole No.: DH 23 - 9 Lab. No.: 77 - 2016 Date: February 25, 1977

HEAD RAW ANALYSIS						
R.M.%	Ash%	V.M.%	F.C %	S.%	H.G.I.	REMARKS
0.4	24.1	16.3	54.6	0.52	98.2	Air Dried Basis
- - -	24.2	16.4	54.6	0.52	- - -	Dry Basis

SIZE / RAW ANALYSES								
Size Fraction	Wt. %	R.M.%	Ash %	S. %	CUMULATIVE			
					Wt. %	Ash %	S. %	
¼" x 65m	89.9	0.4	24.7	0.54	89.9	24.7	0.54	A.D.B.
	89.9	- - -	24.8	0.54	89.9	24.8	0.54	D.B.
65m x 0	10.1	0.7	17.8	0.64	100.0	24.0	0.55	A.D.B.
	10.1	- - -	17.9	0.64	100.0	24.1	0.55	D.B.

SINK - FLOAT ANALYSIS: ¼" x 65 M									
S. G.	Wt.%	R.M%	Ash %	V.M%	F.C%	S.%	Cumulative		
							Wt. %	Ash %	
-1.40	55.9	0.4	5.8	18.9	74.9	0.64	55.4	5.8	A.D.B.
	56.0	- - -	5.8	18.9	75.3	0.64	56.0	5.8	D.B.
1.40-1.50	14.3	0.5	17.5	16.8	65.2	0.57	70.2	8.2	A.D.B.
	14.3	- - -	17.6	16.9	65.5	0.57	70.3	8.2	D.B.
1.50-1.60	4.2	0.6	26.9	- - -	- - -	- - -	74.4	9.2	A.D.B.
	4.2	- - -	27.1	- - -	- - -	- - -	74.5	9.3	D.B.
+1.60	25.6	1.0	71.2	- - -	- - -	- - -	100.0	25.1	A.D.B.
	25.5	- - -	71.9	- - -	- - -	- - -	100.0	25.3	D.B.

COMPOSITE ¼" x 65 m FLOATS @ 1.50 S.G., A.D.B.						
F.S.I.	P % on Coal	DILATATION TESTS				
		Softening Temp.(°C)	Max. Dil. Temp.(°C)	Maximum Contr. %	Maximum Dil. %	G.No.
6½	0.008					

Lab. No. 8590 Date March/77

Client: Warnock Hersey

Sample Identification: 77-2016

Starting Temperature °C: 350

Softening Temperature °C: 404

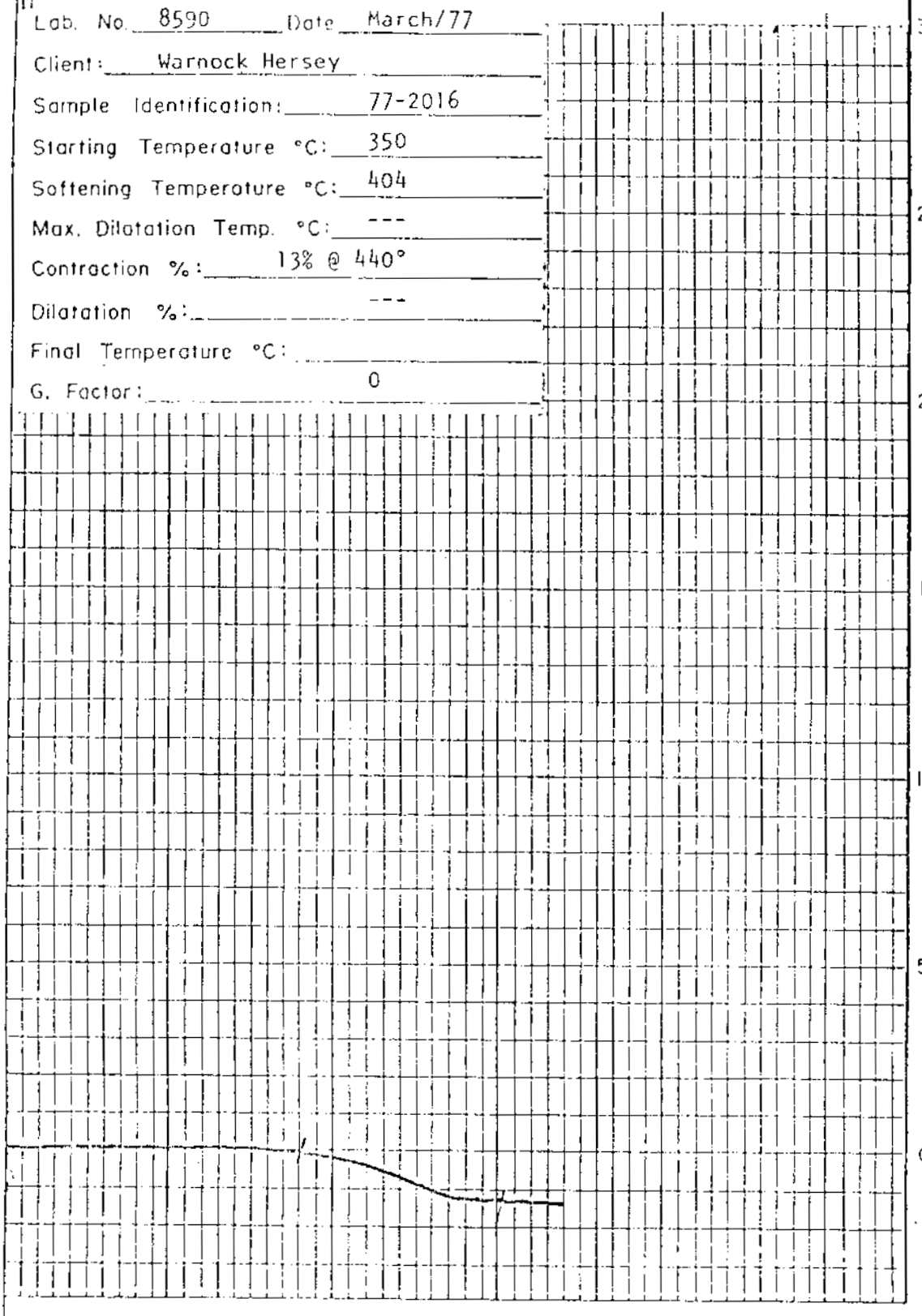
Max. Dilatation Temp. °C: ---

Contraction %: 13% @ 440°

Dilatation %: ---

Final Temperature °C:

G. Factor: 0



BIRTLEY ENGINEERING (CANADA) LTD.

Title

RUHR DILATOMETER TEST

Date

Drawn

Warnock Hersey Professional Services Ltd.

ELCO MINING LTD. CORE SAMPLE ANALYSIS

Hole No.: DH 23 - 10 Lab. No.: 77 - 2017 Date: February 25, 1977

HEAD RAW ANALYSIS						
R.M.%	Ash%	V.M.%	F.C %	S.%	H.G.I.	REMARKS
0.5	32.2	15.5	51.8	0.57	82.3	Air Dried Basis
- - -	32.4	15.6	52.0	0.57	- --	Dry Basis

SIZE / RAW ANALYSES								
Size Fraction	Wt. %	R.M.%	Ash %	S. %	CUMULATIVE			
					Wt. %	Ash %	S. %	
¼" x 65m	88.8	0.5	34.2	0.48	88.8	34.2	0.48	A.D.B.
	88.8	- - -	34.3	0.48	88.8	34.3	0.48	D.B.
65m x 0	11.2	0.7	23.4	0.66	100.0	33.0	0.50	A.D.B.
	11.2	- - -	23.6	0.66	100.0	33.1	0.50	D.B.

SINK - FLOAT ANALYSIS: ¼" x 65 M									
S. G.	Wt.%	R.M%	Ash %	V.M%	F.C%	S.%	Cumulative		
							Wt. %	Ash %	
-1.40	40.0	0.6	5.2	19.3	74.9	0.77	40.0	5.2	A.D.B.
	40.0	- - -	5.2	19.4	75.4	0.77	40.0	5.2	D.B.
1.40-1.50	7.5	0.6	17.3	17.4	64.8	0.58	47.5	7.1	A.D.B.
	7.5	- - -	17.4	17.5	65.2	0.58	47.5	7.1	D.B.
1.50-1.60	4.5	0.9	26.2	- - -	- - -	- - -	52.0	8.8	A.D.B.
	4.5	- --	26.4	- - -	- - -	- - -	52.0	8.8	D.B.
+1.60	48.0	1.0	60.2	- - -	- - -	- - -	100.0	33.5	A.D.B.
	48.0	- - -	60.8	- - -	- - -	- - -	100.0	33.8	D.B.

COMPOSITE ¼" x 65 m FLOATS @ 1.50 S.G., A.D.B.						
F.S.I.	P % on Coal	DILATATION TESTS				
		Softening Temp.(°C)	Max. Dil. Temp.(°C)	Maximum Contr. %	Maximum Dil. %	G.No.
7	0.037					

Lab No. 8591 Date March/77

Client: Warnock Hersey

Sample Identification: 77-2017

Starting Temperature °C: 350

Softening Temperature °C: 401

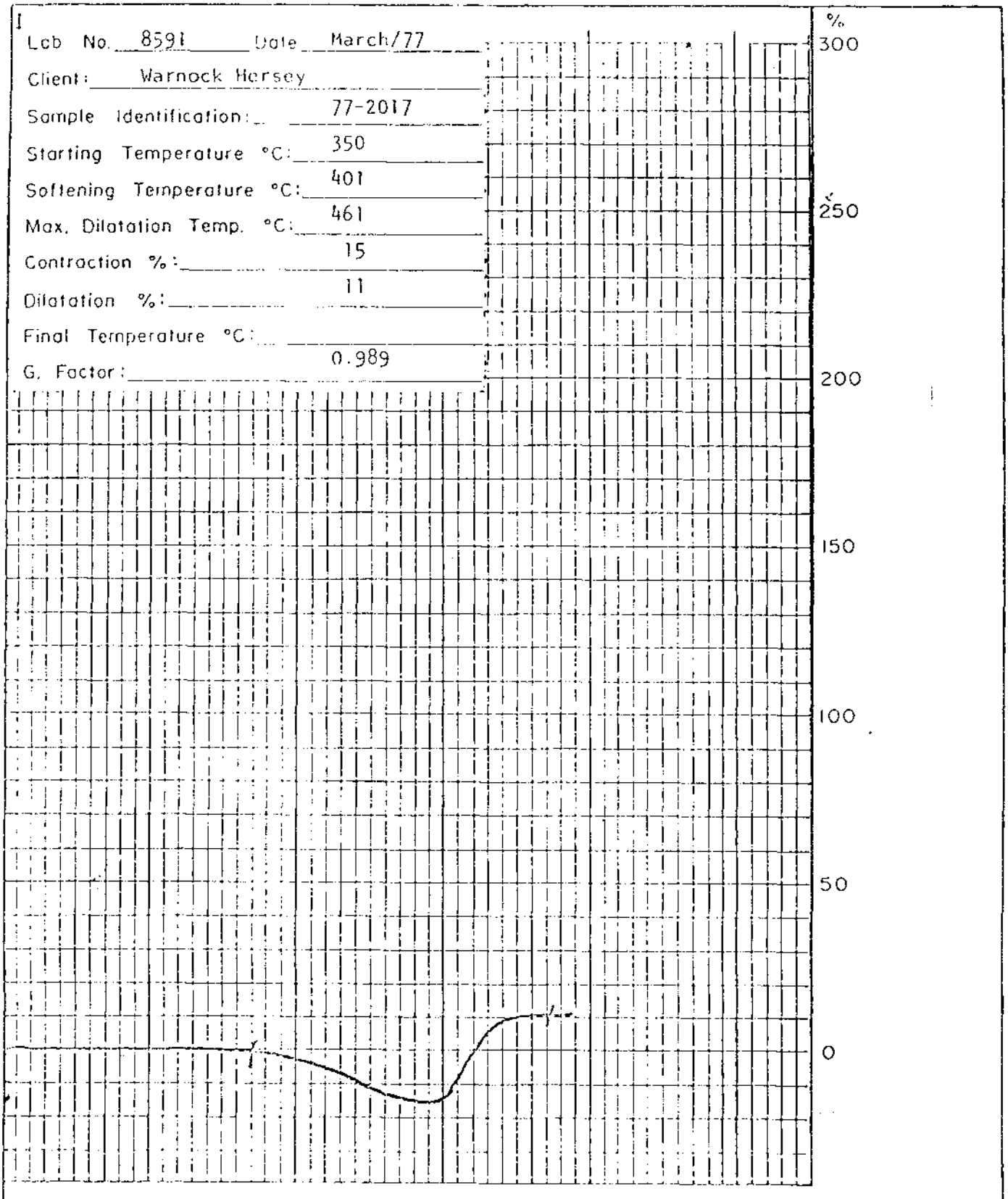
Max. Dilatation Temp. °C: 461

Contraction %: 15

Dilatation %: 11

Final Temperature °C:

G. Factor: 0.989



BIRTLEY ENGINEERING (CANADA) LTD.

Title

RUHR DILATOMETER TEST

Date

Drawn

Warnock Hersey Professional Services Ltd.

ELCO MINING LTD. CORE SAMPLE ANALYSIS

Hole No.: DH 23 - 11 Lab. No.: 77 - 2018 Date: February 25, 1977

HEAD RAW ANALYSIS						
R.M.%	Ash%	V.M.%	F.C %	S.%	H.G.I.	REMARKS
0.7	25.2	15.8	58.3	0.40	96.2	Air Dried Basis
- - -	25.3	15.9	58.8	0.40	- - - -	Dry Basis

SIZE / RAW ANALYSES								
Size Fraction	Wt. %	R.M.%	Ash %	S. %	CUMULATIVE			
					Wt. %	Ash %	S. %	
¼" x 65m	86.8	0.5	26.2	0.35	86.8	26.2	0.35	A.D.B.
	86.8	- - -	26.3	0.35	86.8	26.3	0.35	D.B.
65m x 0	13.2	0.6	17.5	0.43	100.0	25.0	0.36	A.D.B.
	13.2	- - -	17.6	0.43	100.0	25.1	0.36	D.B.

SINK - FLOAT ANALYSIS: ¼" x 65 M									
S. G.	Wt.%	R.M%	Ash %	V.M%	F.C%	S.%	Cumulative		
							Wt. %	Ash %	
-1.40	59.5	0.4	5.2	18.4	76.0	0.45	59.5	5.2	A.D.B.
	59.6	- - -	5.2	18.4	76.4	0.45	59.6	5.2	D.B.
1.40-1.50	9.3	0.8	15.5	17.0	66.7	0.36	68.8	6.6	A.D.B.
	9.3	- - -	15.6	17.2	67.2	0.36	68.9	6.6	D.B.
1.50-1.60	2.5	0.7	23.8	- - -	- - -	- - -	71.3	7.2	A.D.B.
	2.5	- - -	24.0	- - -	- - -	- - -	71.4	7.2	D.B.
+1.60	28.7	1.0	75.8	- - -	- - -	- - -	100.0	26.9	A.D.B.
	28.6	- - -	76.6	- - -	- - -	- - -	100.0	27.0	D.B.

COMPOSITE ¼" x 65 m FLOATS @ 1.50 S.G., A.D.B.						
F.S.I.	P % on Coal	DILATATION TESTS				
		Softening Temp. (°C)	Max. Dil. Temp. (°C)	Maximum Contr. %	Maximum Dil. %	G.No.
3½	0.042					

II

Lab. No. 8592 Date March/77

Client: Warnock Hersey

Sample Identification: 77-2018

Starting Temperature °C: 350

Softening Temperature °C: 413

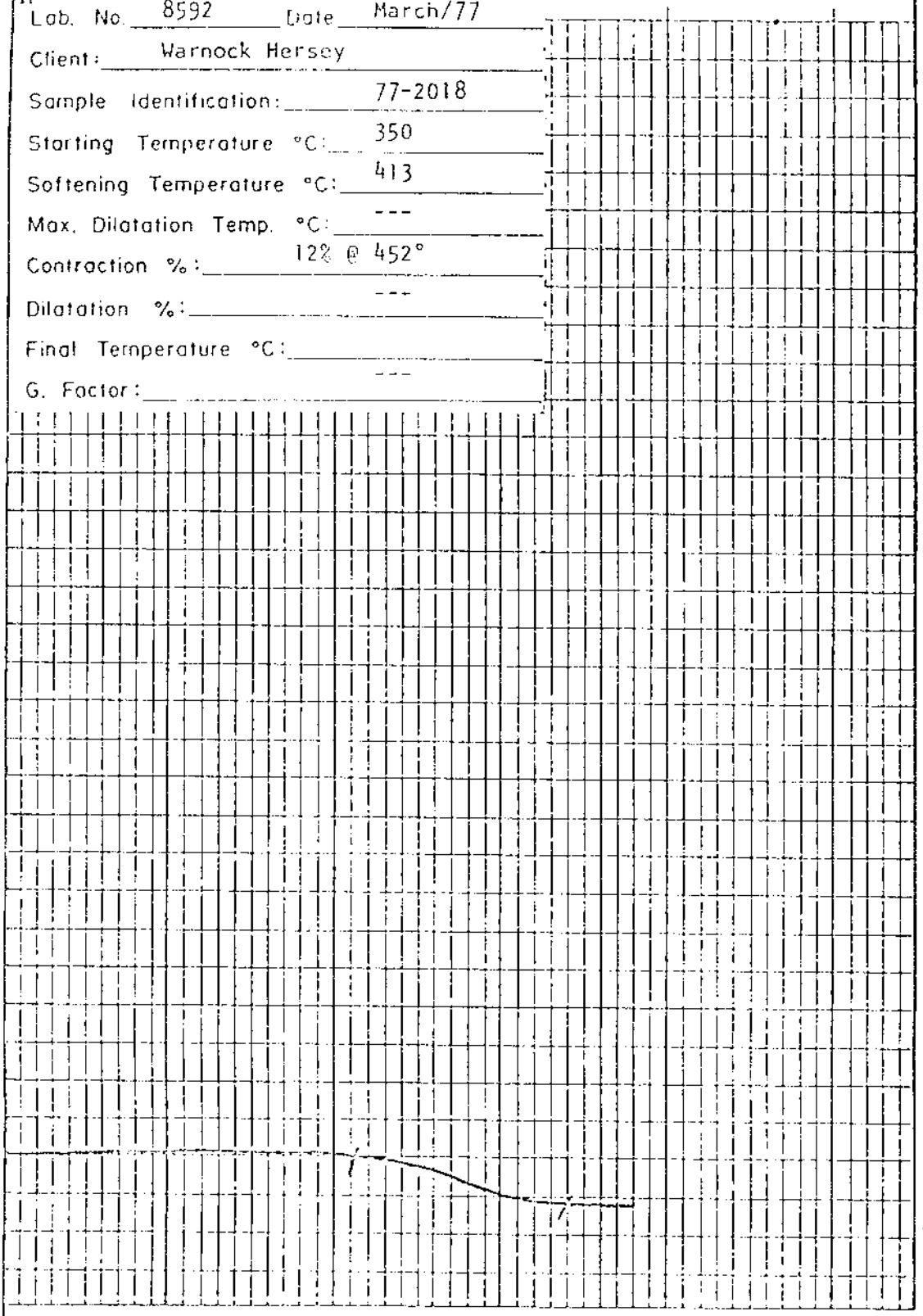
Max. Dilatation Temp. °C: ---

Contraction %: 12% @ 452°

Dilatation %: ---

Final Temperature °C: ---

G. Factor: ---



BIRTLEY ENGINEERING (CANADA) LTD.

Title	Date
RUHR DILATOMETER TEST	
	Drawn

ELCO MINING LTD.

CORE SAMPLE ANALYSIS

HOLE NO.: DH - 24 - 1 Lab. No 8225 DATE: Feb./77

HEAD RAW ANALYSIS						
R.M. %	ASH %	V.M. %	F.C. %	S. %	M.G.I.	REMARKS
0.8	46.1	16.2	36.9	0.73	73	Air Dried Basis
	46.5	16.3	37.2	0.74	--	Dry Basis

SIZE/RAW ANALYSES								
SIZE FRACTION	WT. %	R.M. %	ASH %	S. %	CUMULATIVE WT. %	CUMULATIVE ASH %	CUMULATIVE S. %	
1/4" x 65M	94.2	0.8	46.2	0.66	94.2	46.2	0.66	A.D.B.
	94.2		46.6	0.67	94.2	46.6	0.67	D.B.
65M x 0	5.8	0.8	30.9	0.96	100.0	45.3	0.68	A.D.B.
	5.8		31.1	0.97	100.0	45.7	0.69	D.B.

SINK-FLOAT ANALYSIS: 1/4" x 65M									
S. G.	WT. %	R.M. %	ASH %	V.M. %	F.C. %	S. %	CUMULATIVE WT. %	CUMULATIVE ASH %	
-1.40	40.2	0.7	4.0	25.8	69.5	0.89	40.2	4.0	A.D.B.
	40.2		4.0	26.0	70.0	0.90	40.2	4.0	D.B.
1.40-1.50	3.6	0.7	20.3	20.9	58.1	0.83	43.8	5.3	A.D.B.
	3.6		20.4	21.0	58.6	0.84	43.8	5.3	D.B.
1.50-1.60	1.6	0.8	28.8				45.4	6.2	A.D.B.
	1.6		29.0				45.4	6.2	D.B.
+1.60	54.6	0.5	78.1				100.0	45.4	A.D.B.
	54.6		78.5				100.0	45.7	D.B.

COMPOSITE 1/4" x 65M FLOATS @ 1.50 S.G., A.D.B.						
F.S.I.	P2O5 ON COAL	DILATATION TEST SOFTENING TEMP. (°C)	MAX. DIL. TEMP. (°C)	MAXIMUM CONTR. %	MAXIMUM DIL. %	G. NO.
9	.08	356	441	18	282	1.104

Birtley Engineering

Subsidiary of Great West Steel Industries

Lab. No. 8225 Date Feb. 10, 1977

Client: ELCO MINING LTD.

Sample Identification: DH-24-1

Starting Temperature °C: 350

Softening Temperature °C: 356

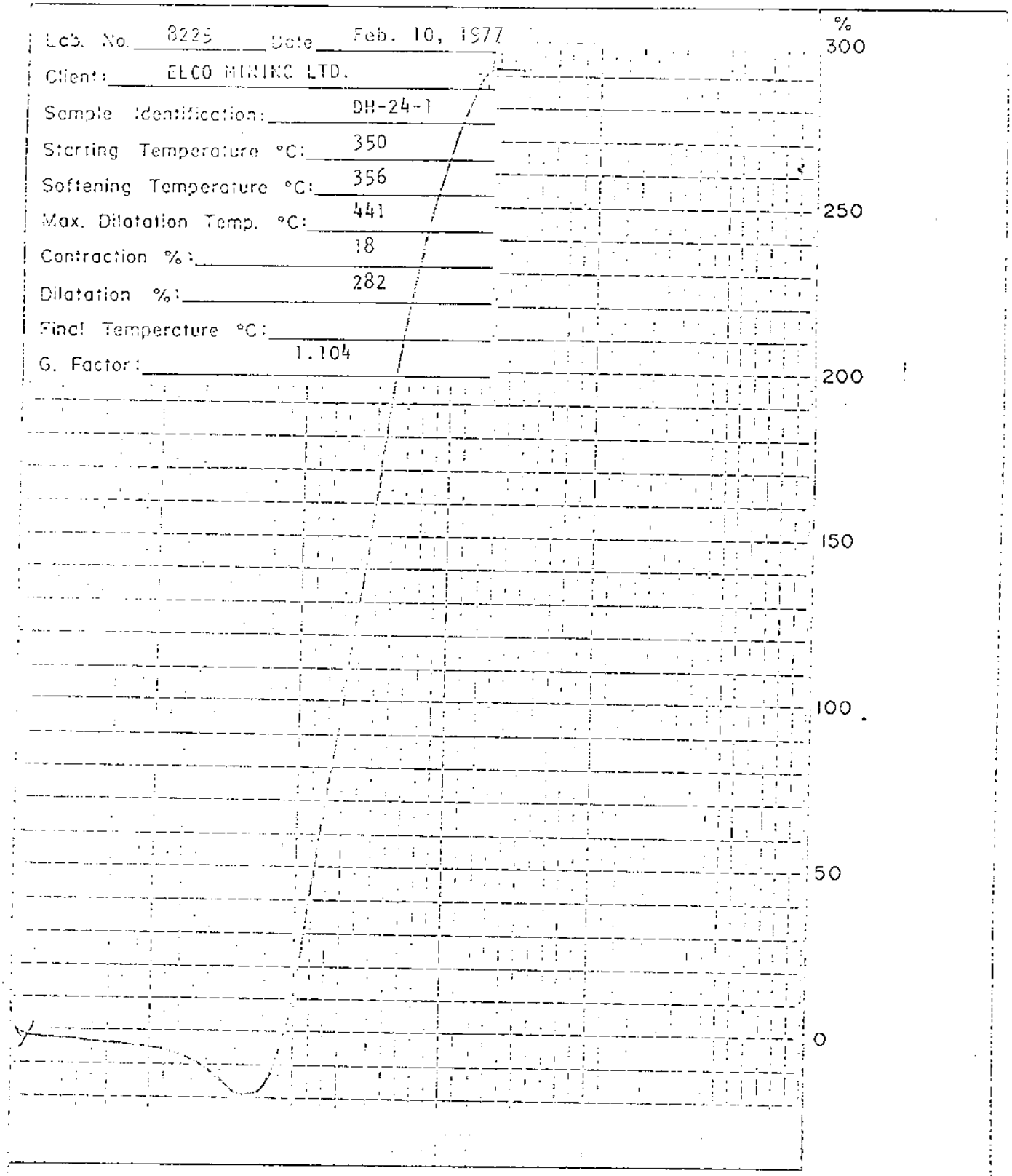
Max. Dilatation Temp. °C: 441

Contraction %: 18

Dilatation %: 282

Final Temperature °C:

G. Factor: 1.104



BRITLEY ENGINEERING (CANADA) LTD.

Title	Date
RUHR DILATOMETER TEST	
	Drawn

ELCO MINING LTD.

CORE SAMPLE ANALYSIS

HOLE NO.: DH - 24 - 2 Lab. No. 8226 DATE: Feb./77

HEAD RAW ANALYSIS						
R.M. %	ASH %	V.M. %	F.C. %	S. %	H.G.I.	REMARKS
0.8	26.8	20.6	51.8	0.67	93	Air Dried Basis
	27.0	20.8	52.2	0.68	--	Dry Basis

SIZE/RAW ANALYSES								
SIZE FRACTION	WT. %	R.M. %	ASH %	S. %	CUMULATIVE WT. %	CUMULATIVE ASH %	CUMULATIVE S. %	
1/4" x 65M	94.1	0.7	28.5	0.64	94.1	28.5	0.64	A.D.B.
	94.1		28.7	0.64	94.1	28.7	0.64	D.B.
65M x 0	5.9	1.1	17.2	0.77	100.0	27.8	0.65	A.D.B.
	5.9		17.4	0.78	100.0	28.0	0.65	D.B.

SINK-FLOAT ANALYSIS: 1/4" x 65M									
S. G.	WT. %	R.M. %	ASH %	V.M. %	F.C. %	S. %	CUMULATIVE WT. %	CUMULATIVE ASH %	
-1.40	55.7	0.8	4.9	25.5	68.8	0.79	55.7	4.9	A.D.B.
	55.6		4.9	25.7	69.4	0.80	55.6	4.9	D.B.
1.40-1.50	3.7	0.8	18.0	22.4	58.8	0.76	59.4	5.7	A.D.B.
	3.7		18.1	22.6	59.3	0.77	59.3	5.7	D.B.
1.50-1.60	3.4	0.9	27.5				62.8	6.9	A.D.B.
	3.4		27.7				62.7	6.9	D.B.
+1.60	37.2	0.4	65.1				100.0	28.5	A.D.B.
	37.3		65.4				100.0	28.7	D.B.

COMPOSITE 1/4" x 65M FLOATS @ 1.50 S.G., A.D.B.						
F.S.I.	P% ON COAL	DILATATION TEST				
		SOFTENING TEMP. (°C)	MAX. DIL. TEMP. (°C)	MAXIMUM CONTR. %	MAXIMUM DIL. %	G. NO.
9	.06	356	441	16	259	1.104

Birtley Engineering

Subsidiary of Great West Steel Industries

Lab. No. 8226 Date Feb. 10, 1977

Client: ELCO MINING LTD.

Sample Identification: DH-24-2

Starting Temperature °C: 350

Softening Temperature °C: 356

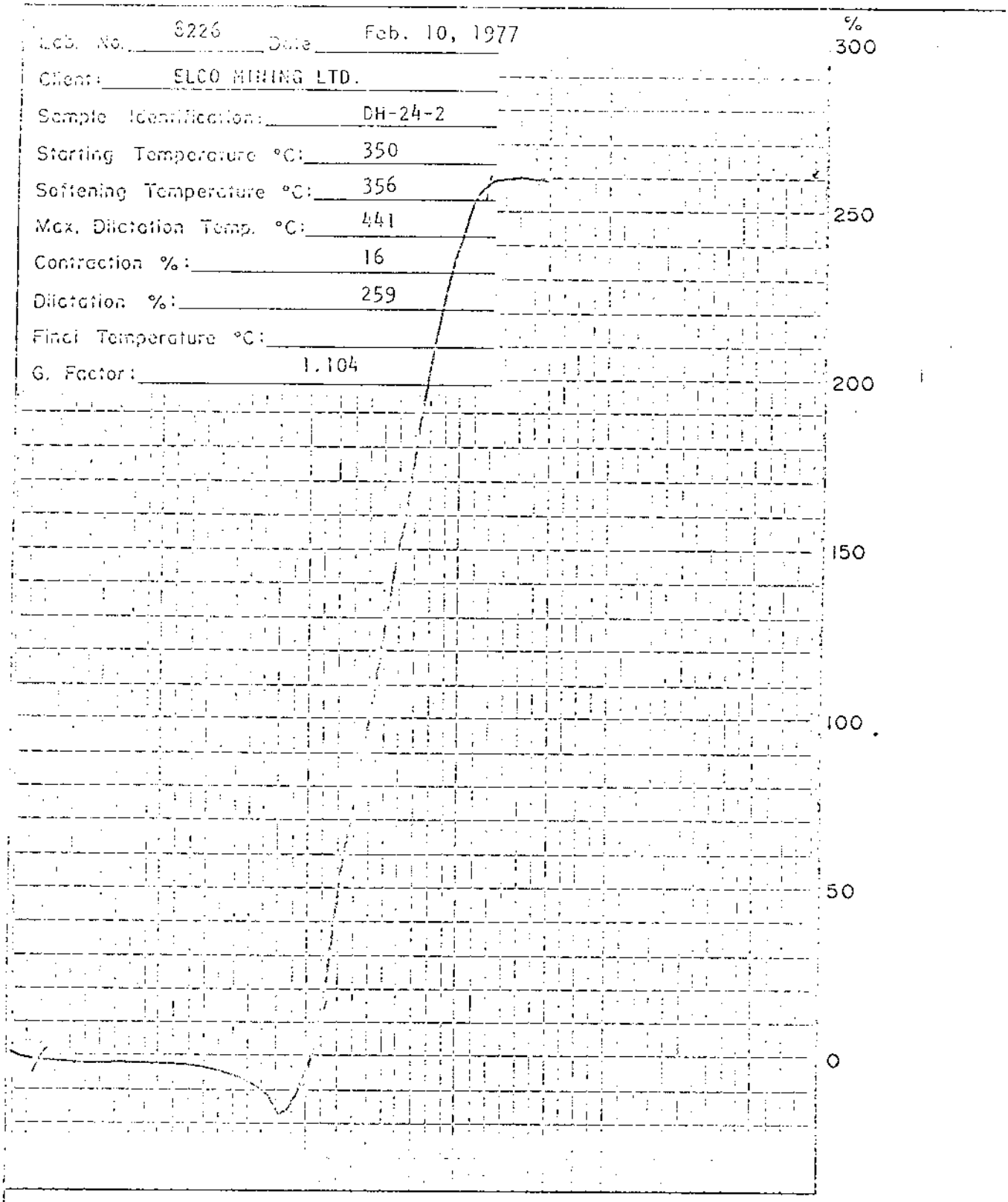
Max. Dilatation Temp. °C: 441

Contraction %: 16

Dilatation %: 259

Final Temperature °C:

G. Factor: 1.104



BARTLEY ENGINEERING (CANADA) LTD.

Title	Date
RUHR DILATOMETER TEST	
	Drawn

ELCO MINING LTD.

CORE SAMPLE ANALYSIS

HOLE NO.: DH - 24 - 3 Lab. No. 8227 DATE: Feb./77

HEAD RAW ANALYSIS						
R.M. %	ASH %	V.M. %	F.C. %	S. %	H.G.I.	REMARKS:
0.8	34.0	19.3	45.9	0.75	84	Air Dried Basis
	34.3	19.5	46.2	0.76	--	Dry Basis

SIZE/RAW ANALYSES								
SIZE FRACTION	WT. %	R.M. %	ASH %	S. %	CUMULATIVE WT. %	CUMULATIVE ASH %	CUMULATIVE S. %	
1/4" x 65M	95.3	0.7	33.7	0.77	95.3	33.7	0.77	A.D.B.
	95.3		33.9	0.78	95.3	33.9	0.78	D.B.
65M x 0	4.7	0.9	21.2	0.90	100.0	33.1	0.78	A.D.B.
	4.7		21.4	0.91	100.0	33.3	0.79	D.B.

SINK-FLOAT ANALYSIS: 1/4" x 65M									
S. G.	WT. %	R.M. %	ASH %	V.M. %	F.C. %	S. %	CUMULATIVE WT. %	CUMULATIVE ASH %	
-1.40	59.6	0.6	5.8	25.3	68.3	1.00	59.6	5.8	A.D.B.
	59.6		5.8	25.5	68.7	1.01	59.6	5.8	D.B.
1.40-1.50	5.4	0.6	20.1	21.9	57.4	0.94	65.0	7.0	A.D.B.
	5.4		20.2	22.0	57.8	0.95	65.0	7.0	D.B.
1.50-1.60	2.3	0.7	28.2				67.3	7.7	A.D.B.
	2.3		28.4				67.3	7.7	D.B.
+1.60	32.7	0.7	88.1				100.0	34.0	A.D.B.
	32.7		88.7				100.0	34.2	D.B.

COMPOSITE 1/4" x 65M FLOATS @ 1.50 S.G., A.D.B.						
F.S.I.	P% ON COAL	DILATATION TEST				
		SOFTENING TEMP. (°C)	MAX. DIL. TEMP. (°C)	MAXIMUM CONTR. %	MAXIMUM DIL. %	G. NO.
8 1/2	.08	362	432	22	247	1.080

Birtley Engineering

Subsidiary of Great West Steel Industries

Lab. No. 8227 Date Feb. 10, 1977

Client: ELCO MINING LTD.

Sample Identification: DH-24-3

Starting Temperature °C: 350

Softening Temperature °C: 362

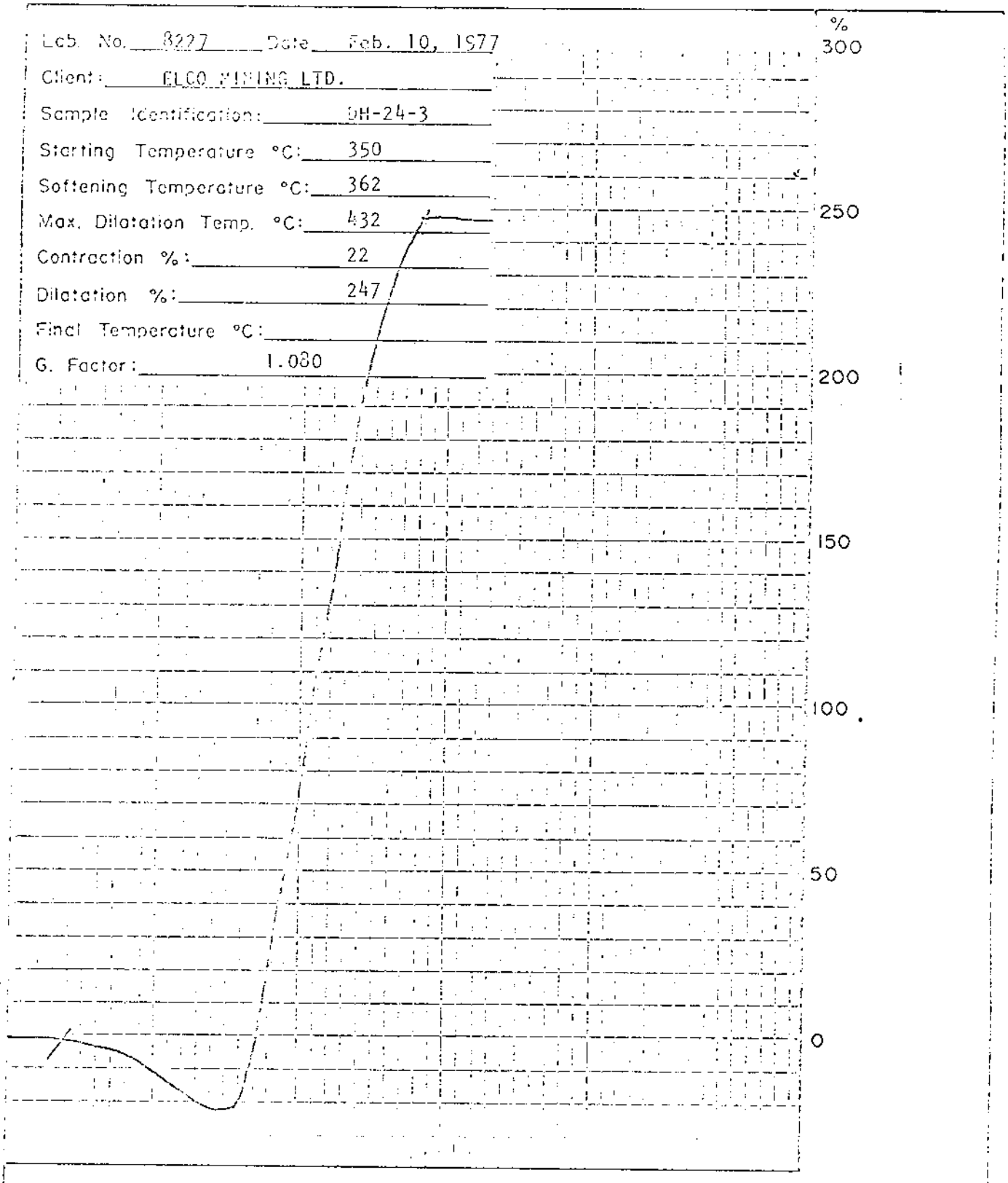
Max. Dilatation Temp. °C: 432

Contraction %: 22

Dilatation %: 247

Final Temperature °C:

G. Factor: 1.080



BURTLEY ENGINEERING (CANADA) LTD.

Title	Date
RUHR DILATOMETER TEST	
	Drawn

ELCO MINING LTD.

CORE SAMPLE ANALYSIS

HOLE NO.: DH - 24 - 4 Lab. No. 8228 DATE: Feb./77

HEAD RAW ANALYSIS						
R.M. %	ASH %	V.M. %	F.C. %	S. %	H.G.I.	REMARKS
0.5	10.9	24.3	64.3	0.97	101	Air Dried Basis
	11.0	24.4	64.6	0.97	---	Dry Basis

SIZE/RAW ANALYSES								
SIZE FRACTION	WT. %	R.M. %	ASH %	S. %	CUMULATIVE WT. %	CUMULATIVE ASH %	CUMULATIVE S. %	
1/4" x 65M	92.0	0.7	10.2	0.96	92.0	10.2	0.96	A.D.B.
	92.0		10.3	0.97	92.0	10.3	0.97	D.B.
65M x 0	8.0	0.7	13.3	0.99	100.0	10.4	0.96	A.D.B.
	8.0		13.4	1.00	100.0	10.5	0.97	D.B.

SINK-FLOAT ANALYSIS: 1/4" x 65M									
S. G.	WT. %	R.M. %	ASH %	V.M. %	F.C. %	S. %	CUMULATIVE WT. %	CUMULATIVE ASH %	
-1.40	84.8	0.6	5.3	25.4	68.7	1.00	84.8	5.3	A.D.B.
	84.8		5.3	25.6	69.1	1.01	84.8	5.3	D.B.
1.40-1.50	6.2	0.7	22.1	21.6	55.6	0.81	91.0	6.4	A.D.B.
	6.2		22.3	21.8	55.9	0.82	91.0	6.5	D.B.
1.50-1.60	5.3	0.9	30.9				96.3	7.8	A.D.B.
	5.3		31.2				96.3	7.8	D.B.
+1.60	3.7	1.1	55.5				100.0	9.6	A.D.B.
	3.7		56.1				100.0	9.6	D.B.

COMPOSITE 1/4" x 65M FLOATS @ 1.50 S.G., A.D.B.						
F.S.I.	P% ON COAL	DILATATION TEST SOFTENING TEMP. (°C)	MAX. DIL. TEMP. (°C)	MAXIMUM CONTR. %	MAXIMUM DIL. %	G. NO.
9	.06	368	434	22	284	1.076

Birtley Engineering

Subsidiary of Great West Steel Industries

Lab. No. 8228 Date Feb. 10, 1977

Client: ELCO MINING LTD.

Sample Identification: DH-24-4

Starting Temperature °C: 350

Softening Temperature °C: 368

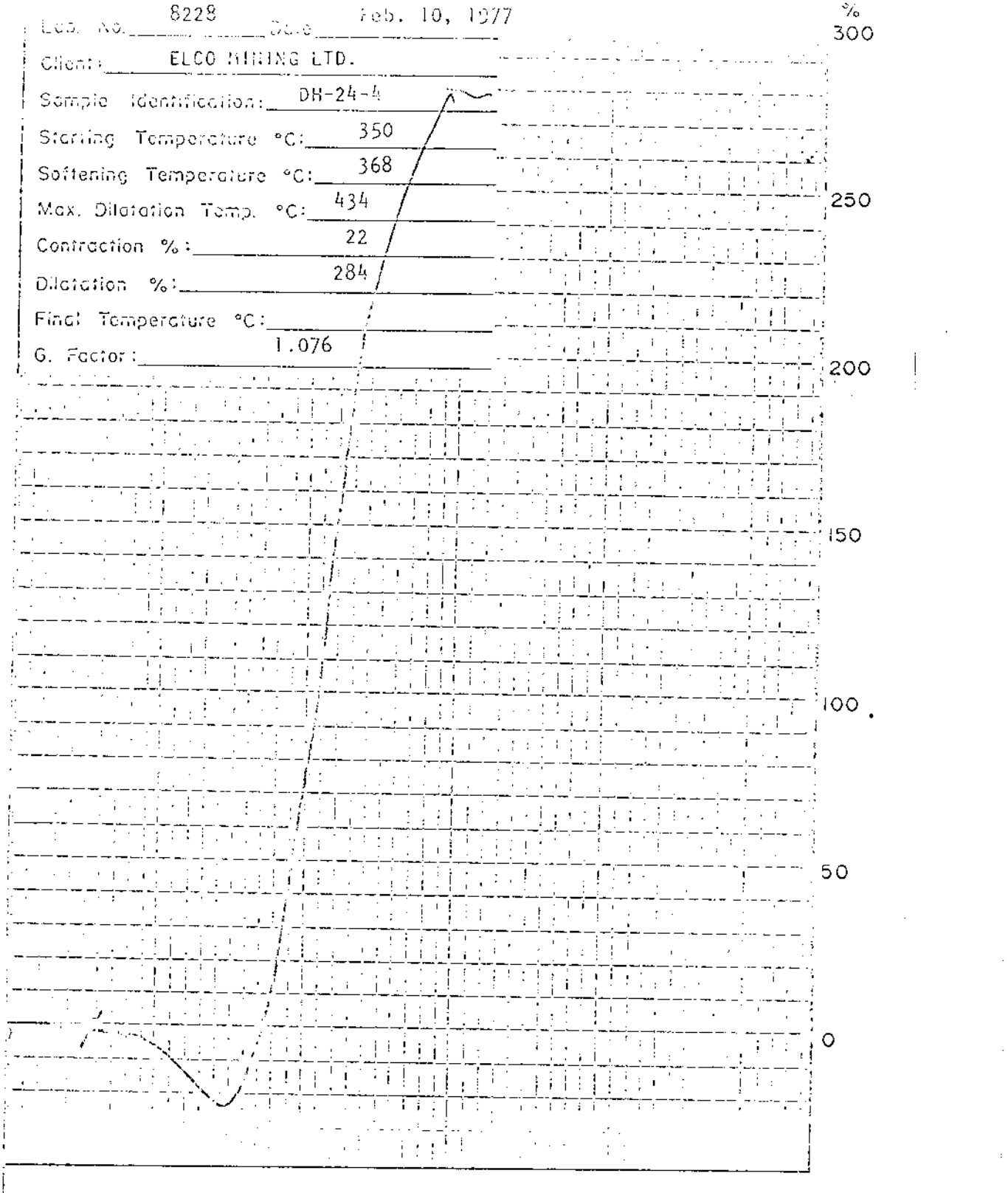
Max. Dilatation Temp. °C: 434

Contraction %: 22

Dilatation %: 284

Final Temperature °C:

G. Factor: 1.076



BARTLEY ENGINEERING (CANADA) LTD.

Title	Date
RUHR DILATOMETER TEST	
	Drawn

ELCO MINING LTD.

CORE SAMPLE ANALYSIS

HOLE NO.: DH -24 - 5 Lab. No. 8229 DATE: Feb./77

HEAD RAW ANALYSIS						
R.M. %	ASH %	V.M. %	F.C. %	S. %	H.G.I.	REMARKS
0.7	32.6	18.3	48.4	0.77	95	Air Dried Basis
	32.8	18.4	48.8	0.78	--	Dry Basis

SIZE / RAW ANALYSES								
SIZE FRACTION	WT. %	R.M. %	ASH %	S. %	CUMULATIVE WT. %	CUMULATIVE ASH %	CUMULATIVE S. %	
1/4" x 65M	91.8	1.6	32.9	0.75	91.8	32.9	0.75	A.D.B.
	91.8		33.4	0.76	91.8	33.4	0.76	D.B.
65M x 0	8.2	1.2	16.2	0.90	100.0	31.5	0.76	A.D.B.
	8.2		16.4	0.91	100.0	32.0	0.77	D.B.

SINK - FLOAT ANALYSIS: 1/4" x 65M									
S. G.	WT. %	R.M. %	ASH %	V.M. %	F.C. %	S. %	CUMULATIVE WT. %	CUMULATIVE ASH %	
-1.40	55.1	2.1	3.4	25.0	69.5	0.98	55.1	3.4	A.D.B.
	54.8		3.5	25.5	71.0	1.00	54.8	3.5	D.B.
1.40-1.50	4.1	1.4	17.8	21.3	59.5	0.81	59.2	4.4	A.D.B.
	4.2		18.1	21.6	60.3	0.82	59.0	4.5	D.B.
1.50-1.60	3.2	1.3	31.3				62.4	5.8	A.D.B.
	3.2		31.7				62.2	5.9	D.B.
+1.60	37.6	0.9	80.3				100.0	33.8	A.D.B.
	37.8		81.0				100.0	34.3	D.B.

COMPOSITE 1/4" x 65M FLOATS @ 1.50 S.G., A.D.B.						
F.S.I.	P% ON COAL	DILATATION TEST				
		SOFTENING TEMP. (°C)	MAX. DIL. TEMP. (°C)	MAXIMUM CONTR. %	MAXIMUM DIL. %	G. NO.
9	.04	365	410	14	190	1.053

Birtley Engineering

Subsidiary of Great West Steel Industries

Lab. No. 8229 Date Feb. 10, 1977

Client: ELCO MINING LTD.

Sample Identification: DH-24-5

Starting Temperature °C: 350

Softening Temperature °C: 365

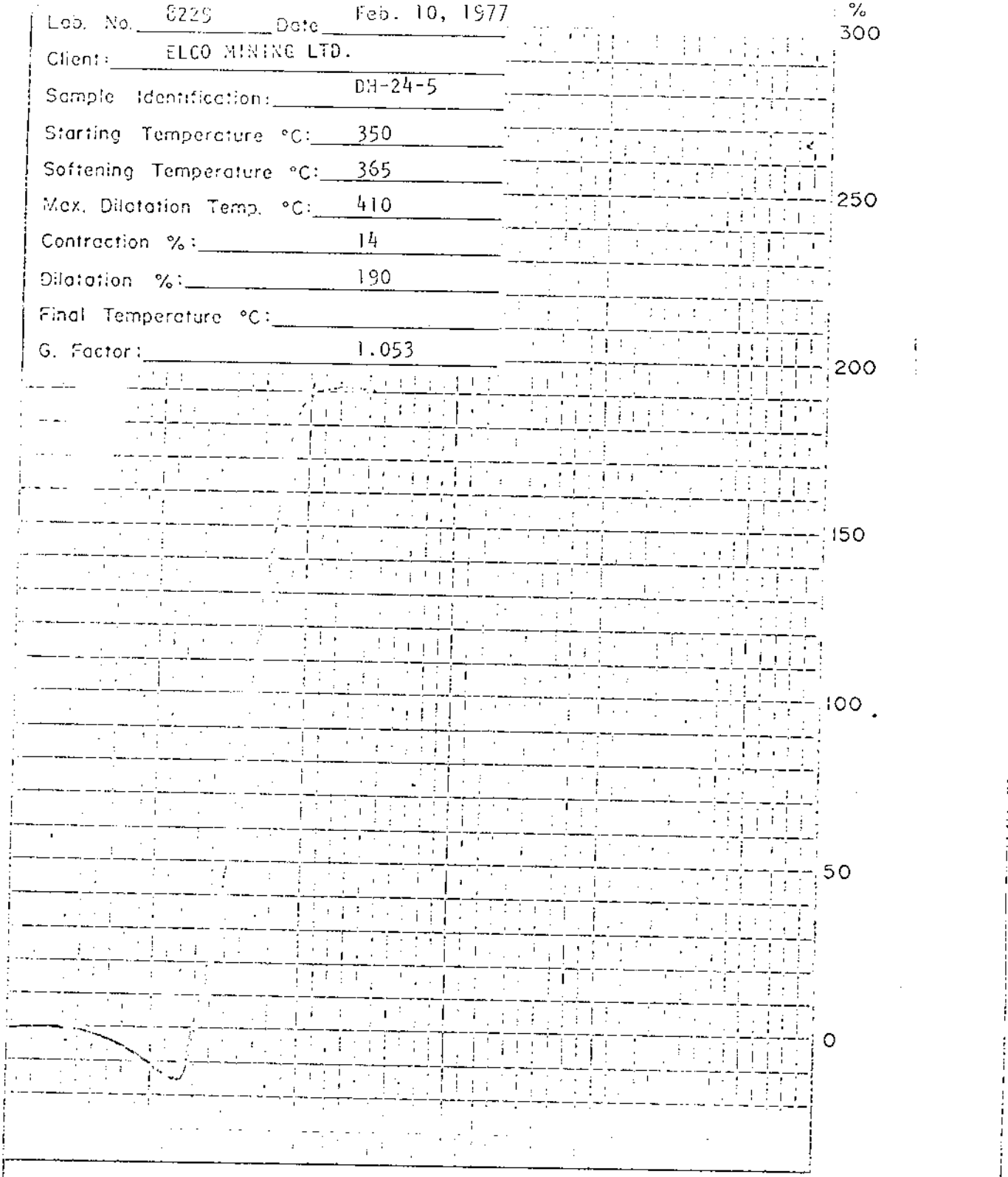
Max. Dilatation Temp. °C: 410

Contraction %: 14

Dilatation %: 190

Final Temperature °C:

G. Factor: 1.053



BRITLEY ENGINEERING (CANADA) LTD.

Title

RUHR DILATOMETER TEST

Date

Drawn

ELCO MINING LTD.

CORE SAMPLE ANALYSIS

HOLE NO.: DH - 24 - 6 Lab. No. 8230 DATE: Feb./77

HEAD RAW ANALYSIS						
R.M. %	ASH %	V.M. %	F.C. %	S. %	H.G.I.	REMARKS
0.7	53.0	15.6	30.7	0.52	67	Air Dried Basis
	53.4	15.7	30.9	0.52	--	Dry Basis

SIZE/RAW ANALYSES								
SIZE FRACTION	WT. %	R.M. %	ASH %	S. %	CUMULATIVE WT. %	CUMULATIVE ASH %	CUMULATIVE S. %	
1/4" x 65M	93.1	0.6	55.0	0.51	93.1	55.0	0.51	A.D.B.
	93.1		55.3	0.51	93.1	55.3	0.51	D.B.
65M x 0	6.9	0.8	33.8	0.71	100.0	53.5	0.52	A.D.B.
	6.9		34.1	0.72	100.0	53.8	0.52	D.B.

SINK-FLOAT ANALYSIS: 1/4" x 65M									
S. G.	WT. %	R.M. %	ASH %	V.M. %	F.C. %	S. %	CUMULATIVE WT. %	CUMULATIVE ASH %	
-1.40	22.5	0.6	5.5	22.3	71.6	1.01	22.5	5.5	A.D.B.
	22.6		5.5	22.4	72.1	1.02	22.6	5.5	D.B.
1.40-1.50	2.6	0.7	22.8	21.2	55.3	0.82	25.1	7.3	A.D.B.
	2.6		23.0	21.3	55.7	0.83	25.2	7.3	D.B.
1.50-1.60	3.9	0.7	32.4				29.0	10.7	A.D.B.
	3.9		32.6				29.1	10.7	D.B.
+1.60	71.0	1.1	72.1				100.0	54.3	A.D.B.
	70.9		72.9				100.0	54.8	D.B.

COMPOSITE 1/4" x 65M FLOATS @ 1.50 S.G., A.D.B.						
F.S.I.	P% ON COAL	DILATATION TEST SOFTENING TEMP. (°C)	MAX. DIL. TEMP. (°C)	MAXIMUM CONTR. %	MAXIMUM DIL. %	G. NO.
9	.12	362	413	23	301	1.060

Birtley Engineering

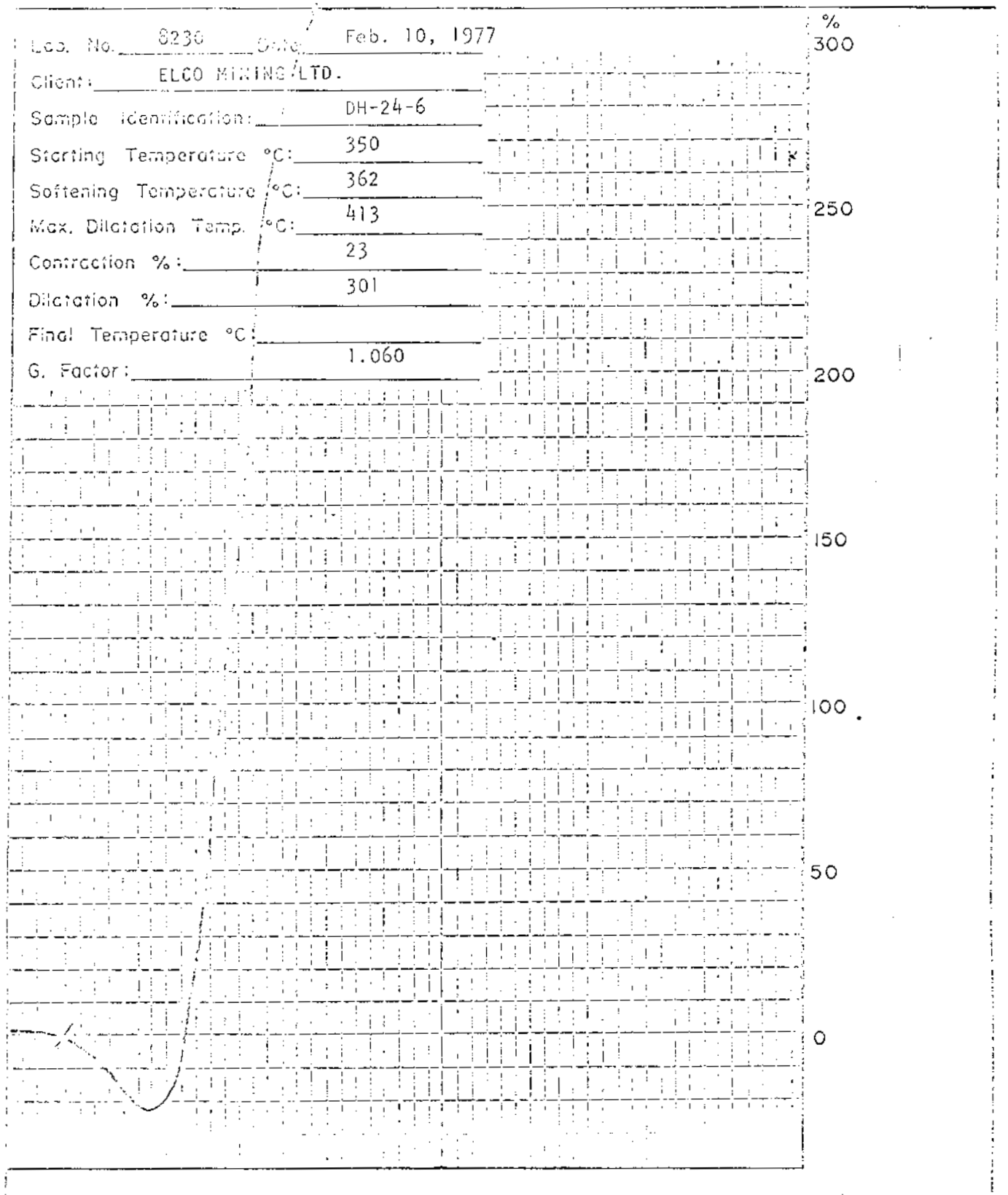
Subsidiary of Great West Steel Industries

Lab. No. 8230 Date Feb. 10, 1977

Client: ELCO MINING LTD.

Sample Identification: DH-24-6

Starting Temperature °C:	350
Softening Temperature °C:	362
Max. Dilatation Temp. °C:	413
Contraction %:	23
Dilatation %:	301
Final Temperature °C:	
G. Factor:	1.060



DIETLEY ENGINEERING (CANADA) LTD.

Title	Date
RUHR DILATOMETER TEST	
	Drawn

ELCO MINING LTD.

CORE SAMPLE ANALYSIS

HOLE NO.: DH - 24 - 7 Lab. No. 8231 DATE: Feb./77

HEAD RAW ANALYSIS						
R.M. %	ASH %	V.M. %	F.C. %	S. %	H.G.I.	REMARKS
1.0	10.4	22.4	66.2	0.84	95	Air Dried Basis
	10.5	22.6	66.9	0.85	--	Dry Basis

SIZE/RAW ANALYSES								
SIZE FRACTION	WT. %	R.M. %	ASH %	S. %	CUMULATIVE WT. %	CUMULATIVE ASH %	CUMULATIVE S. %	
1/4" x 65M	95.2	0.9	10.9	0.85	95.2	10.9	0.85	A.D.B.
	95.2		11.0	0.86	95.2	11.0	0.86	D.B.
65M x 0	4.8	0.9	15.6	0.86	100.0	11.1	0.85	A.D.B.
	4.8		15.7	0.87	100.0	11.2	0.86	D.B.

SINK-FLOAT ANALYSIS: 1/4" x 65M									
S. G.	WT. %	R.M. %	ASH %	V.M. %	F.C. %	S. %	CUMULATIVE WT. %	CUMULATIVE ASH %	
-1.40	74.9	1.0	4.4	23.4	71.2	0.96	74.9	4.4	A.D.B.
	74.9		4.4	23.6	72.0	0.97	74.9	4.4	D.B.
1.40-1.50	7.1	0.9	16.6	18.3	64.2	0.73	82.0	5.5	A.D.B.
	7.1		16.8	18.5	64.7	0.74	82.0	5.5	D.B.
1.50-1.60	14.2	1.0	27.5				96.2	8.7	A.D.B.
	14.2		27.8				96.2	8.8	D.B.
+1.60	3.8	1.1	58.4				100.0	10.6	A.D.B.
	3.8		59.0				100.0	10.7	D.B.

COMPOSITE 1/4" x 65M FLOATS @ 1.50 S.G., A.D.B.						
F.S.I.	P% ON COAL	DILATATION TEST: SOFTENING TEMP. (°C)	MAX. DIL. TEMP. (°C)	MAXIMUM CONTR. %	MAXIMUM DIL. %	G. NO.
8	.04	377	434	19	68	1.041

Birtley Engineering

Subsidiary of Great West Steel Industries

Lab. No. 8231 Date Feb. 10, 1977

Client: ELCO MINING LTD.

Sample Identification: DH-24-7

Starting Temperature °C: 350

Softening Temperature °C: 377

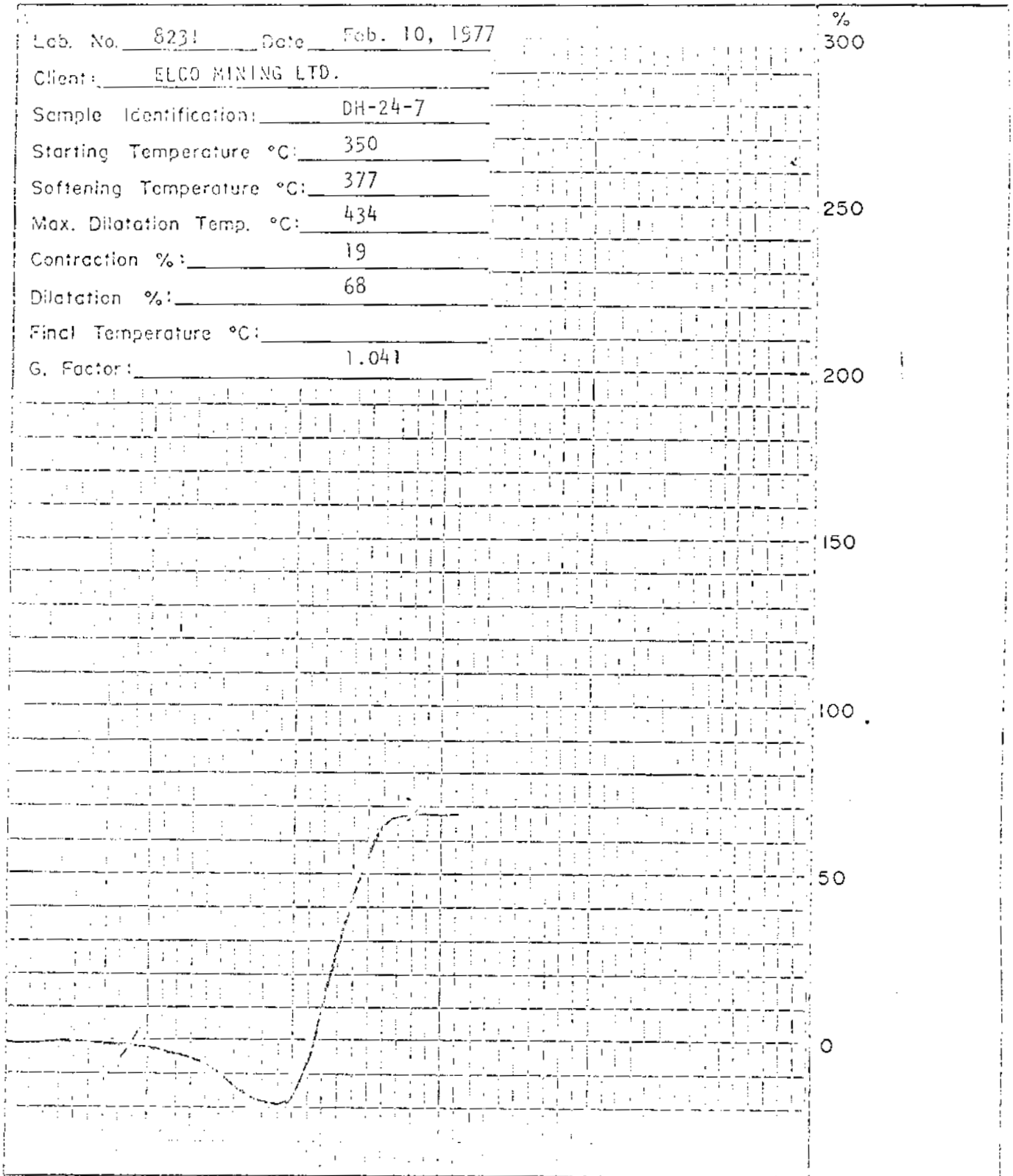
Max. Dilatation Temp. °C: 434

Contraction %: 19

Dilatation %: 68

Final Temperature °C:

G. Factor: 1.041



BIRTLEY ENGINEERING (CANADA) LTD.

Title	Date
RUHR DILATOMETER TEST	
	Drawn

ELCO MINING LTD.

CORE SAMPLE ANALYSIS

HOLE NO.: DH - 24 - 8 Lab. No. 8232 DATE: Feb./77

HEAD RAW ANALYSIS						
R.M. %	ASH %	V.M. %	F.C. %	S. %	H.G.I.	REMARKS
1.3	52.1	15.2	31.4	1.08	57	Air Dried Basis
	52.8	15.4	31.8	1.09	--	Dry Basis

SIZE/RAW ANALYSES								
SIZE FRACTION	WT. %	R.M. %	ASH %	S. %	CUMULATIVE WT. %	CUMULATIVE ASH %	CUMULATIVE S. %	
1/4" x 65M	89.2	1.0	54.7	1.04	89.2	54.7	1.04	A.D.B.
	89.2		55.3	1.05	89.2	55.3	1.05	D.B.
65M x 0	10.8	1.3	38.5	1.18	100.0	53.0	1.06	A.D.B.
	10.8		39.0	1.20	100.0	53.5	1.07	D.B.

SINK-FLOAT ANALYSIS: 1/4" x 65M									
S. G.	WT. %	R.M. %	ASH %	V.M. %	F.C. %	S. %	CUMULATIVE WT. %	CUMULATIVE ASH %	
-1.40	28.3	1.6	4.9	25.3	68.2	1.37	28.3	4.9	A.D.B.
	28.1		5.0	25.7	69.3	1.39	28.1	5.0	D.B.
1.40-1.50	4.9	1.6	11.7	24.4	62.3	1.45	33.2	5.9	A.D.B.
	4.9		11.9	24.8	63.3	1.47	33.0	6.0	D.B.
1.50-1.60	2.3	2.8	25.8				35.5	7.2	A.D.B.
	2.2		26.5				35.2	7.3	D.B.
+1.60	64.5	0.8	79.6				100.0	53.9	A.D.B.
	64.8		80.2				100.0	54.5	D.B.

COMPOSITE 1/4" x 65M FLOATS @ 1.50 S.G., A.D.B.						
F.S.I.	P% ON COAL	DILATATION TEST				
		SOFTENING TEMP. (°C)	MAX. DIL. TEMP. (°C)	MAXIMUM CONTR. %	MAXIMUM DIL. %	G. NO.
9	.05	365	428	20	293	1.074

Birtley Engineering

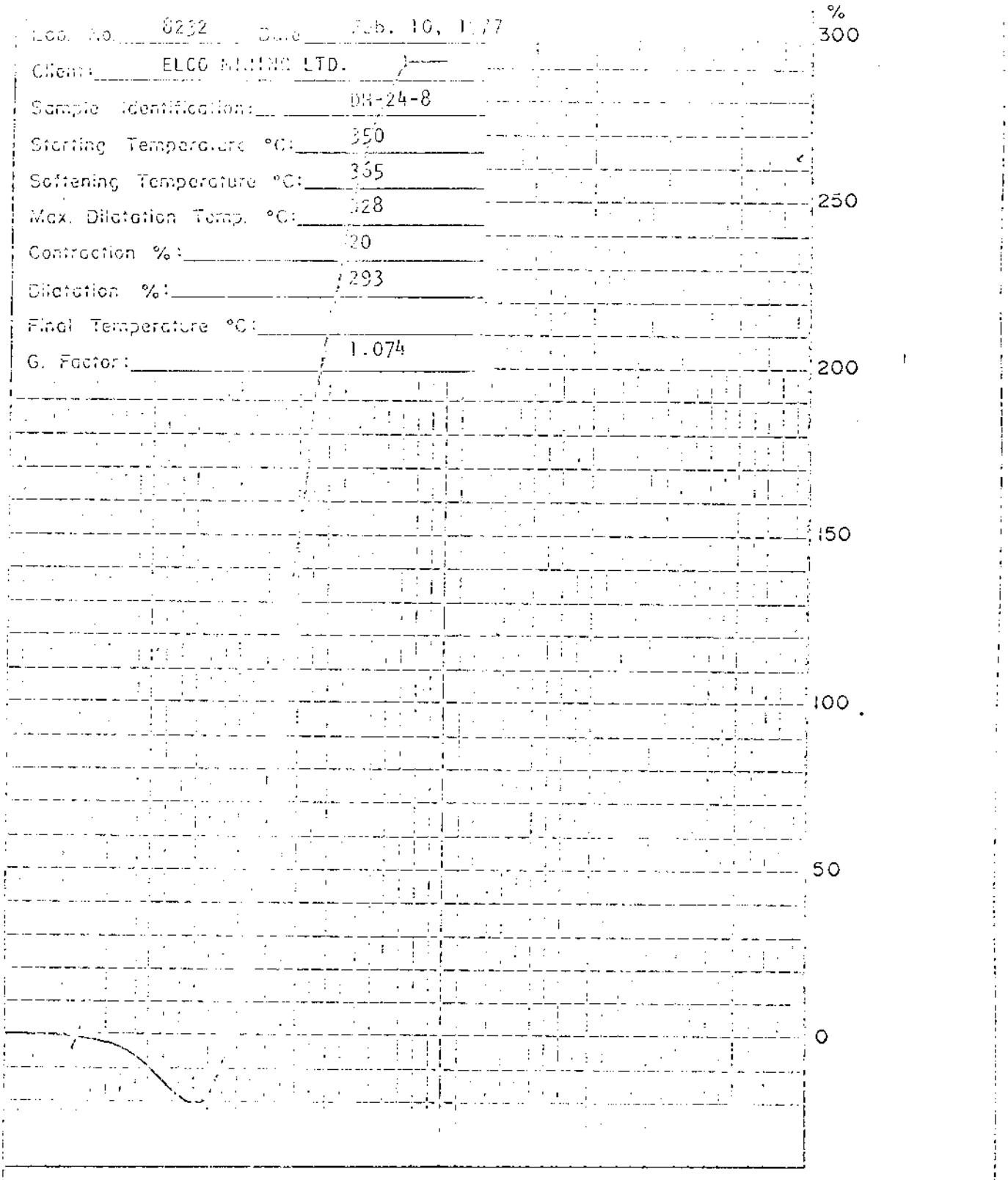
Subsidiary of Great West Steel Industries

Lab. No. 8232 Date Feb. 10, 1977

Client: ELCO MINING LTD.

Sample Identification: DH-24-8

Starting Temperature °C:	350
Softening Temperature °C:	335
Max. Dilatation Temp. °C:	328
Contraction %:	20
Dilatation %:	293
Final Temperature °C:	
G. Factor:	1.074



GRANLEY ENGINEERING (CANADA) LTD.

Title

RUHR DILATOMETER TEST

Date

Drawn

ELCO MINING LTD.

CORE SAMPLE ANALYSIS

HOLE NO.: DH - 24 - 9 Lab. No. 8233 DATE: Feb./77

HEAD RAW ANALYSIS						
R.M. %	ASH %	V.M. %	F.C. %	S. %	H.G.I.	REMARKS
0.8	20.5	18.9	49.8	0.81	100	Air Dried Basis
	30.7	19.1	50.2	0.82	---	Dry Basis

SIZE / RAW ANALYSES								
SIZE FRACTION	WT. %	R.M. %	ASH %	S. %	CUMULATIVE WT. %	CUMULATIVE ASH %	CUMULATIVE S. %	
1/4" x 65M	90.9	1.5	32.0	0.79	90.9	32.0	0.79	A.D.B.
	90.8		32.5	0.80	90.8	32.5	0.80	D.B.
65M x 0	9.1	0.9	22.8	0.88	100.0	31.2	0.80	A.D.B.
	9.2		23.0	0.89	100.0	31.6	0.81	D.B.

SINK - FLOAT ANALYSIS: 1/4" x 65M									
S. G.	WT. %	R.M. %	ASH %	V.M. %	F.C. %	S. %	CUMULATIVE WT. %	CUMULATIVE ASH %	
-1.40	53.9	1.9	5.1	23.1	70.9	1.05	53.9	4.1	A.D.B.
	53.8		4.2	23.5	72.3	1.07	53.8	4.2	D.B.
1.40-1.50	8.6	2.7	14.3	21.0	62.0	0.95	62.5	5.5	A.D.B.
	8.5		14.7	21.6	63.7	0.98	62.3	5.6	D.B.
1.50-1.60	3.0	2.0	24.6				65.5	6.4	A.D.B.
	3.0		25.1				65.3	6.5	D.B.
+1.60	34.5	0.9	82.3				100.0	32.6	A.D.B.
	34.7		83.0				100.0	33.1	D.B.

COMPOSITE 1/4" x 65M FLOATS @ 1.50 S.G., A.D.B.						
F.S.I.	P% ON COAL	DILATATION TEST				
		SOFTENING TEMP. (°C)	MAX. DIL. TEMP. (°C)	MAXIMUM CONTR. %	MAXIMUM DIL. %	G. NO.
9	.11	374	434	19	102	1.054

Birtley Engineering

Subsidiary of Great West Steel Industries

Lab. No. 8233 Date Feb. 10, 1977

Client: ELCO MINING LTD.

Sample Identification: DH-24-9

Starting Temperature °C: 350

Softening Temperature °C: 374

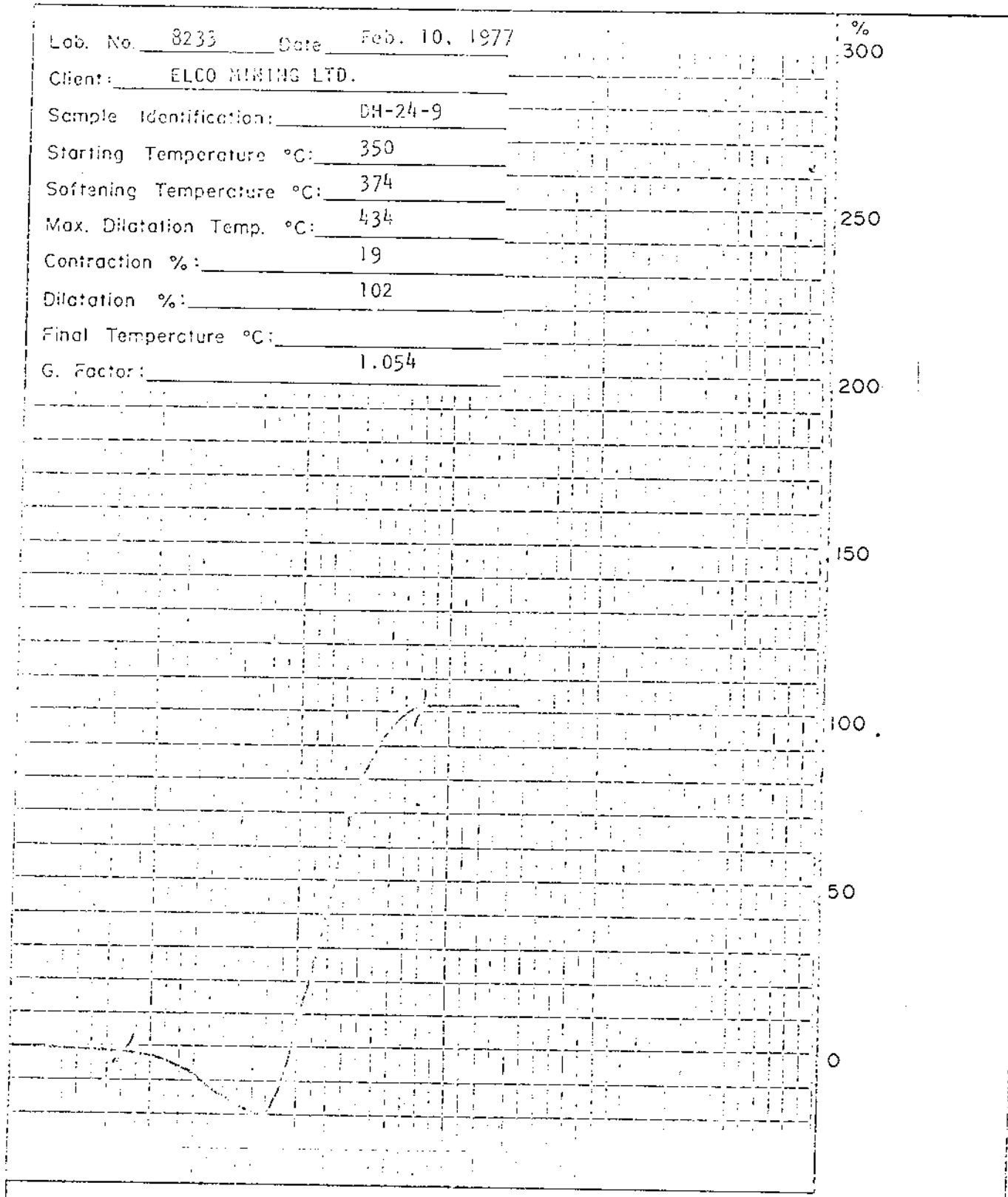
Max. Dilatation Temp. °C: 434

Contraction %: 19

Dilatation %: 102

Final Temperature °C:

G. Factor: 1.054



BIRTLEY ENGINEERING (CANADA) LTD.

Title

RUHR DILATOMETER TEST

Date

Drawn

ELCO MINING LTD.

CORE SAMPLE ANALYSIS

HOLE NO.: DH - 24 - 10 Lab. No. 8234 DATE: Feb./77

HEAD RAW ANALYSIS						
R.M. %	ASH %	V.M. %	F.C. %	S. %	H.G.I.	REMARKS
0.9	34.0	17.9	47.2	1.22	79	Air Dried Basis
	34.3	18.1	47.6	1.23	--	Dry Basis

SIZE / RAW ANALYSES								
SIZE FRACTION	WT. %	R.M. %	ASH %	S. %	CUMULATIVE WT. %	CUMULATIVE ASH %	CUMULATIVE S. %	
1/4" x 65M	91.1	0.8	35.6	1.22	91.1	35.6	1.22	A.D.B.
	91.1		35.9	1.23	91.1	35.9	1.23	D.B.
65M x 0	8.9	1.0	22.4	1.32	100.0	34.4	1.23	A.D.B.
	8.9		22.6	1.33	100.0	34.7	1.24	D.B.

SINK - FLOAT ANALYSIS: 1/4" x 65M									
S. G.	WT. %	R.M. %	ASH %	V.M. %	F.C. %	S. %	CUMULATIVE WT. %	CUMULATIVE ASH %	
-1.40	38.8	1.0	6.7	23.6	68.7	1.47	38.8	6.7	A.D.B.
	38.7		6.8	23.8	69.4	1.48	38.7	6.8	D.B.
1.40-1.50	9.0	0.8	23.2	20.2	55.8	1.21	47.8	9.8	A.D.B.
	9.0		23.4	20.4	56.2	1.22	47.7	9.9	D.B.
1.50-1.60	9.8	0.9	32.3				57.6	13.6	A.D.B.
	9.7		32.6				57.4	13.8	D.B.
+1.60	42.4	0.5	65.9				100.0	35.8	A.D.B.
	42.6		66.2				100.0	36.1	D.B.

COMPOSITE 1/4" x 65M FLOATS @ 1.50 S.G., A.D.B.						
F.S.I.	P% ON COAL	DILATATION TEST				
		SOFTENING TEMP. (°C)	MAX. DIL. TEMP. (°C)	MAXIMUM CONTR. %	MAXIMUM DIL. %	G. NO.
9	.12	374	440	23	245	1.072

Birtley Engineering

Subsidiary of Great West Steel Industries

Lab. No. 8234 Date Feb. 10, 1977

Client: ELCO MINING LTD.

Sample Identification: DH-24-10

Starting Temperature °C: 350

Softening Temperature °C: 374

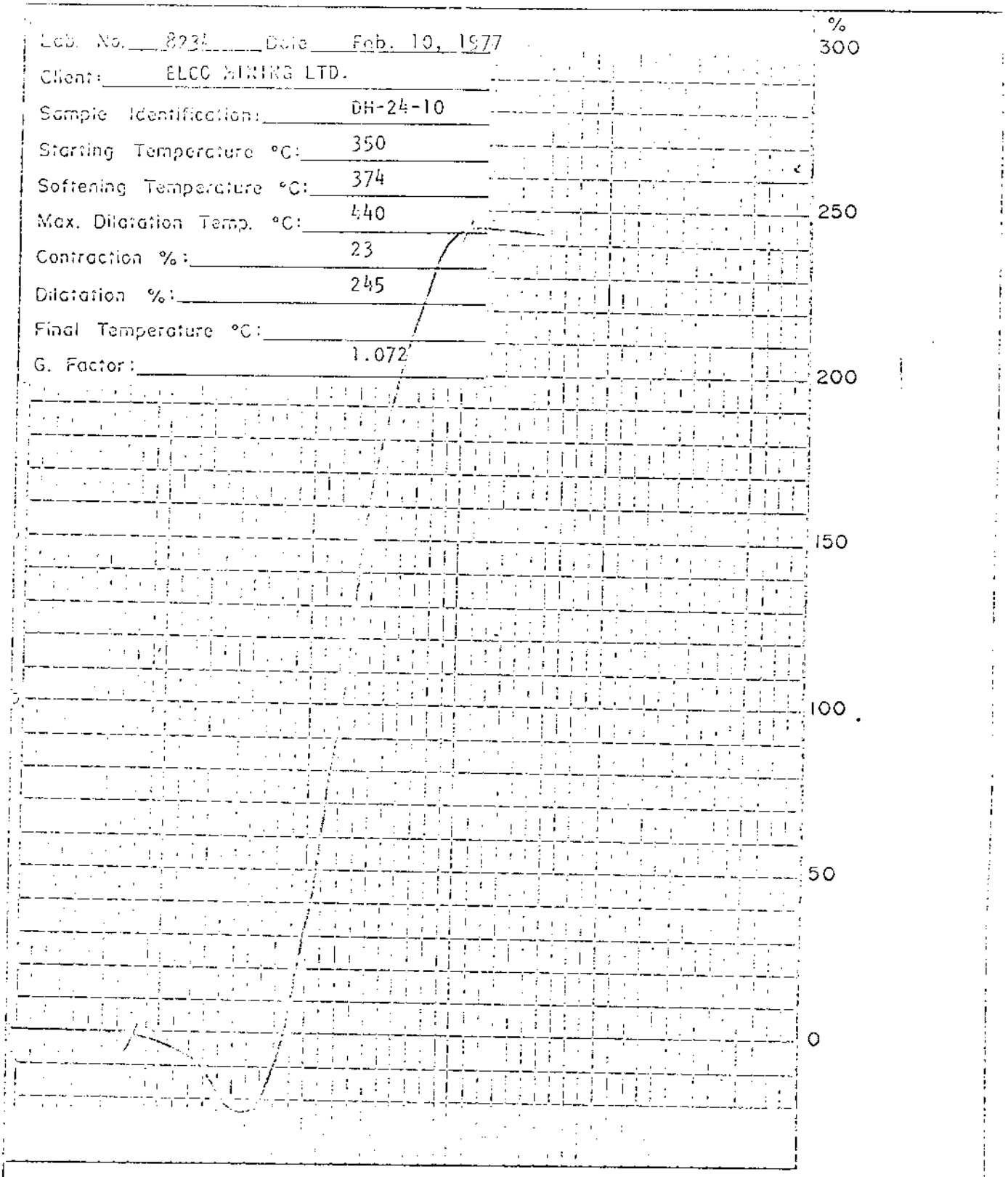
Max. Dilatation Temp. °C: 440

Contraction %: 23

Dilatation %: 245

Final Temperature °C:

G. Factor: 1.072



BAILEY ENGINEERING (CANADA) LTD.

Title

RUHR DILATOMETER TEST

Date

Drawn

ELCO MINING LTD.

CORE SAMPLE ANALYSIS

HOLE NO.: DH - 24 - 11 Lab. No. 8235 DATE: Feb./77

HEAD RAW ANALYSIS						
R.M. %	ASH %	V.M. %	F.C. %	S. %	H.G.I.	REMARKS
0.7	35.4	17.1	46.8	0.53	94	Air Dried Basis
	35.6	17.2	47.2	0.53	--	Dry Basis

SIZE / RAW ANALYSES								
SIZE FRACTION	WT. %	R.M. %	ASH %	S. %	CUMULATIVE WT. %	CUMULATIVE ASH %	CUMULATIVE S. %	
1/4" x 65M	89.9	0.6	37.4	0.52	89.9	37.4	0.52	A.D.B.
	89.9		37.6	0.52	89.9	37.6	0.52	D.B.
65M x 0	10.1	0.8	16.9	0.64	100.0	35.3	0.53	A.D.B.
	10.1		17.0	0.65	100.0	35.5	0.53	D.B.

SINK - FLOAT ANALYSIS: 1/4" x 65M									
S. G.	WT. %	R.M. %	ASH %	V.M. %	F.C. %	S. %	CUMULATIVE WT. %	CUMULATIVE ASH %	
-1.40	48.2	1.9	4.7	22.8	70.6	0.79	48.2	4.7	A.D.B.
	47.9		4.8	23.2	72.0	0.81	47.9	4.8	D.B.
1.40-1.50	5.5	1.0	19.7	18.8	60.5	0.71	53.7	6.2	A.D.B.
	5.5		19.9	19.0	61.1	0.72	53.4	6.3	D.B.
1.50-1.60	3.7	1.1	29.8				57.4	7.8	A.D.B.
	3.8		30.1				57.2	7.9	D.B.
+1.60	42.6	1.0	78.9				100.0	38.1	A.D.B.
	42.8		79.7				100.0	38.6	D.B.

COMPOSITE 1/4" x 65M FLOATS @ 1.50 S.G., A.D.B.						
F.S.I.	P% ON COAL	DILATATION TEST: SOFTENING TEMP. (°C)	MAX. DIL. TEMP. (°C)	MAXIMUM CONTR. %	MAXIMUM DIL. %	G. NO.
9	.04	383	437	19	68	1.039

Birtley Engineering

Subsidiary of Great West Steel Industries

Lab. No. 8235 Date Feb. 10, 1977

Client: ELCO MINING LTD.

Sample Identification: DH-24-11

Starting Temperature °C: 350

Softening Temperature °C: 383

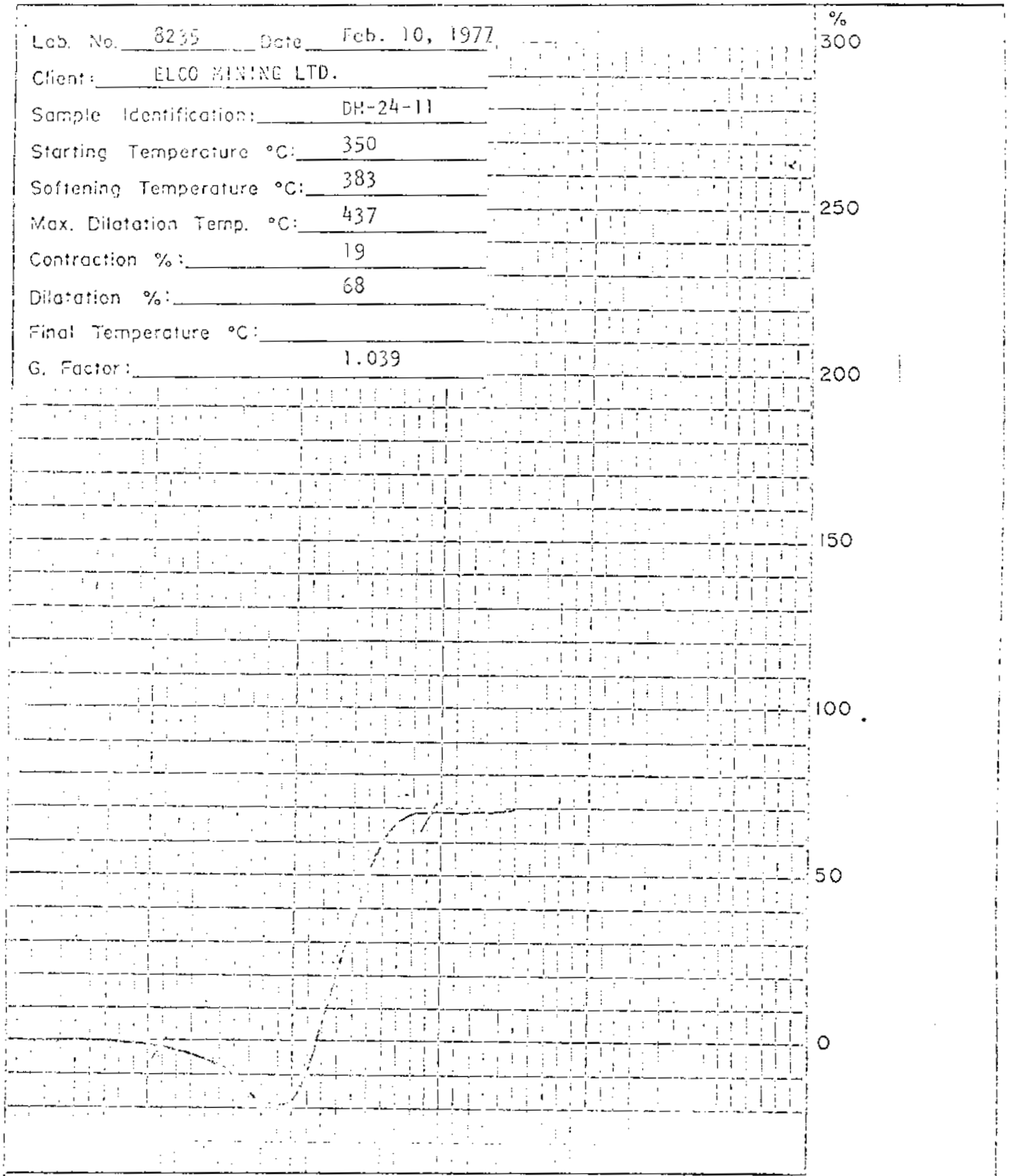
Max. Dilatation Temp. °C: 437

Contraction %: 19

Dilatation %: 68

Final Temperature °C:

G. Factor: 1.039



GIBTLEY ENGINEERING (CANADA) LTD.

Title

RUHR DILATOMETER TEST

Date

Drawn

ELCO MINING LTD.

CORE SAMPLE ANALYSIS

HOLE NO.: DH - 24 - 12 Lab. No. 8236 DATE: Feb./77

HEAD RAW ANALYSIS						
R.M. %	ASH %	V.M. %	F.C. %	S. %	H.G.I.	REMARKS
0.6	25.5	17.6	56.3	0.39	89	Air Dried Basis
	25.6	17.7	56.7	0.39	--	Dry Basis

SIZE / RAW ANALYSES								
SIZE FRACTION	WT. %	R.M. %	ASH %	S. %	CUMULATIVE WT. %	CUMULATIVE ASH %	CUMULATIVE S. %	
1/4" x 65M	94.7	0.8	26.9	0.36	94.7	26.9	0.36	A.D.B.
	94.7		27.1	0.36	94.7	27.1	0.36	D.B.
65M x 0	5.3	0.7	15.5	0.51	100.0	26.3	0.37	A.D.B.
	5.3		15.6	0.51	100.0	26.5	0.37	D.B.

SINK - FLOAT ANALYSIS: 1/4" x 65M									
S. G.	WT. %	R.M. %	ASH %	V.M. %	F.C. %	S. %	CUMULATIVE WT. %	CUMULATIVE ASH %	
-1.40	59.5	0.7	5.5	20.4	73.4	0.50	59.5	5.5	A.D.B.
	59.4		5.5	20.5	74.0	0.50	59.4	5.5	D.B.
1.40-1.50	7.5	0.8	17.7	17.5	64.0	0.40	67.0	6.9	A.D.B.
	7.5		17.8	17.6	64.6	0.40	66.9	6.9	D.B.
1.50-1.60	3.4	0.8	28.0				70.4	7.9	A.D.B.
	3.4		28.2				70.3	7.9	D.B.
+1.60	29.6	0.5	70.8				100.0	26.5	A.D.B.
	29.7		71.1				100.0	26.7	D.B.

COMPOSITE 1/4" x 65M FLOATS @ 1.50 S.G., A.D.B.						
F.S.I.	P% ON COAL	DILATATION TEST				
		SOFTENING TEMP., (°C)	MAX. DIL. TEMP. (°C)	MAXIMUM CONTR. %	MAXIMUM DIL. %	G. NO.
7	.07	407	449	13	- 10	0.727

Birtley Engineering

Subsidiary of Great West Steel Industries

8236 Feb. 10, 1977

Client: ELCO MINING LTD.

Sample Number: DH-24-12

Start Temperature °C: 350

Softening Temperature °C: 407

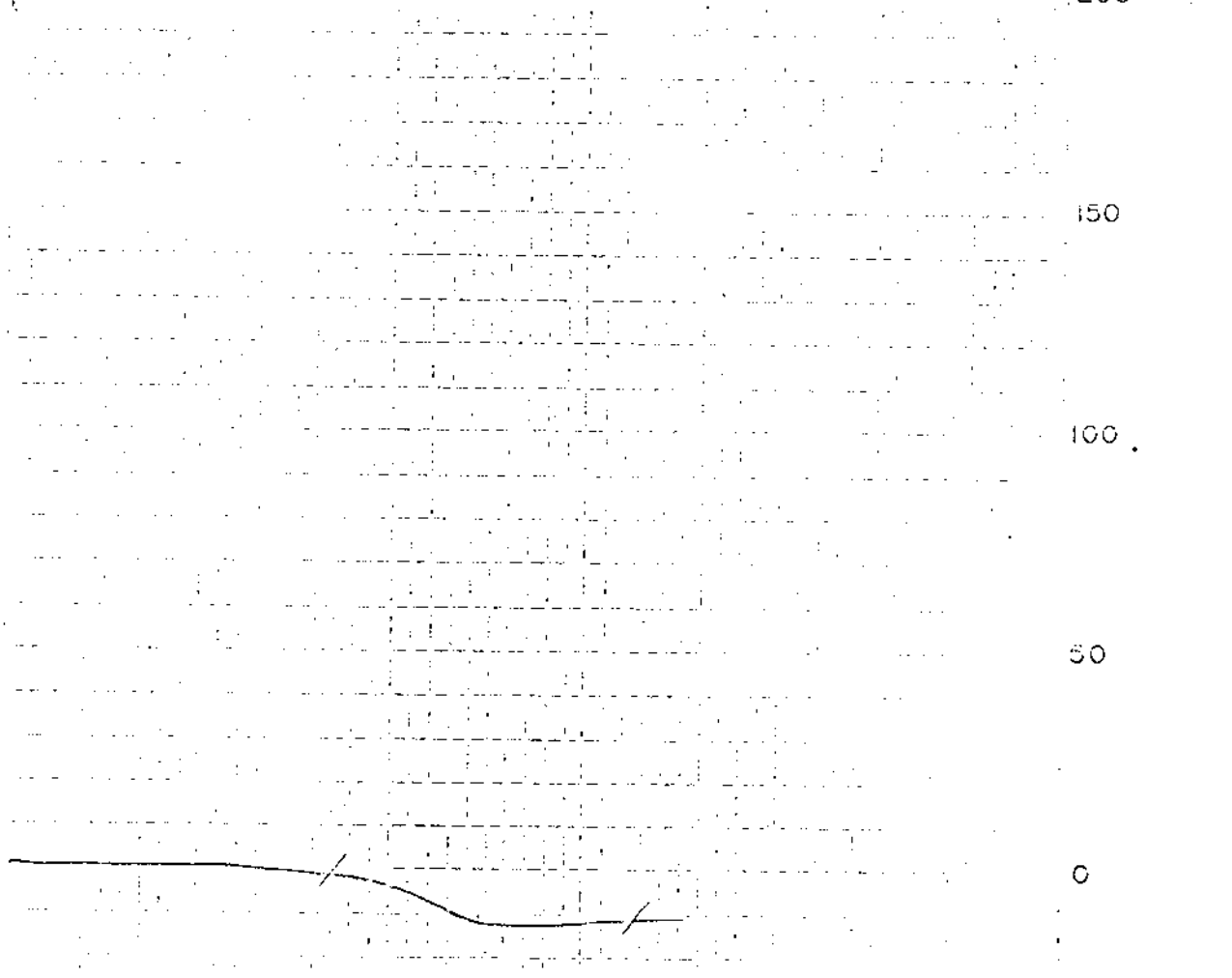
Max. Dilatation Temp. °C: 449

Contraction %: 13

Dilatation %: - 10

Final Temperature °C:

G. Factor: 0.727



Title

Date

RUHR DILATOMETER TEST

Drawn

Warnock Hersey Professional Services Ltd.

CORE SAMPLE ANALYSIS

Hole No.: DH - 25 - 1 Lab. No.: 77 - 1019 Date: February 20, 1977

HEAD RAW ANALYSIS						
R.M.%	Ash%	V.M.%	F.C.%	S.%	H.G.I.	REMARKS
0.8	35.5	20.6	43.1	0.66	80.9	Air Dried Basis
- -	35.8	20.7	43.5	0.66	- - -	Dry Basis

SIZE / RAW ANALYSES								
Size Fraction	Wt. %	R.M.%	Ash %	S. %	CUMULATIVE			
					Wt. %	Ash %	S. %	
¼" x 65m	82.6	0.7	35.8	0.65	82.6	35.8	0.65	A.D.B.
	82.6	- - -	36.0	0.65	82.6	36.0	0.65	D.B.
65m x 0	17.4	0.8	25.5	0.77	100.0	34.0	0.67	A.D.B.
	17.4	- - -	25.7	0.78	100.0	34.2	0.67	D.B.

SINK - FLOAT ANALYSIS: ¼" x 65 M									
S. G.	Wt.%	R.M%	Ash %	V.M%	F.C%	S.%	Cumulative		
							Wt. %	Ash %	
-1.40	28.4	0.8	9.1	27.2	62.9	0.88	24.8	9.1	A.D.B.
	28.4	- - -	9.2	27.4	63.4	0.89	24.8	9.2	D.B.
1.40-1.50	15.8	1.0	12.2	24.8	62.0	0.82	44.2	9.5	A.D.B.
	15.8	- - -	12.4	25.0	62.6	0.83	44.2	9.6	D.B.
1.50-1.60	9.1	0.9	26.4	- - -	- - -	- - -	53.3	12.4	A.D.B.
	9.1	- - -	26.6	- - -	- - -	- - -	53.3	12.5	D.B.
+1.60	46.7	0.8	63.4	- - -	- - -	- - -	100.0	36.2	A.D.B.
	46.7	- - -	63.9	- - -	- - -	- - -	100.0	36.5	D.B.

COMPOSITE ¼" x 65 m FLOATS @ 1.50 S.G., A.D.B.						
F.S.I.	F % on Coal	DILATATION TESTS				
		Softening Temp.(°C)	Max. Dil. Temp.(°C)	Maximum Contr. %	Maximum Dil. %	G.No.
7½	0.007	374°C	437°C	22%	163%	1.063

Lab. No. 8281 Date Feb/77

Client: Warnock Hersey

Sample Identification: 77-1019

Starting Temperature °C: 350

Softening Temperature °C: 374

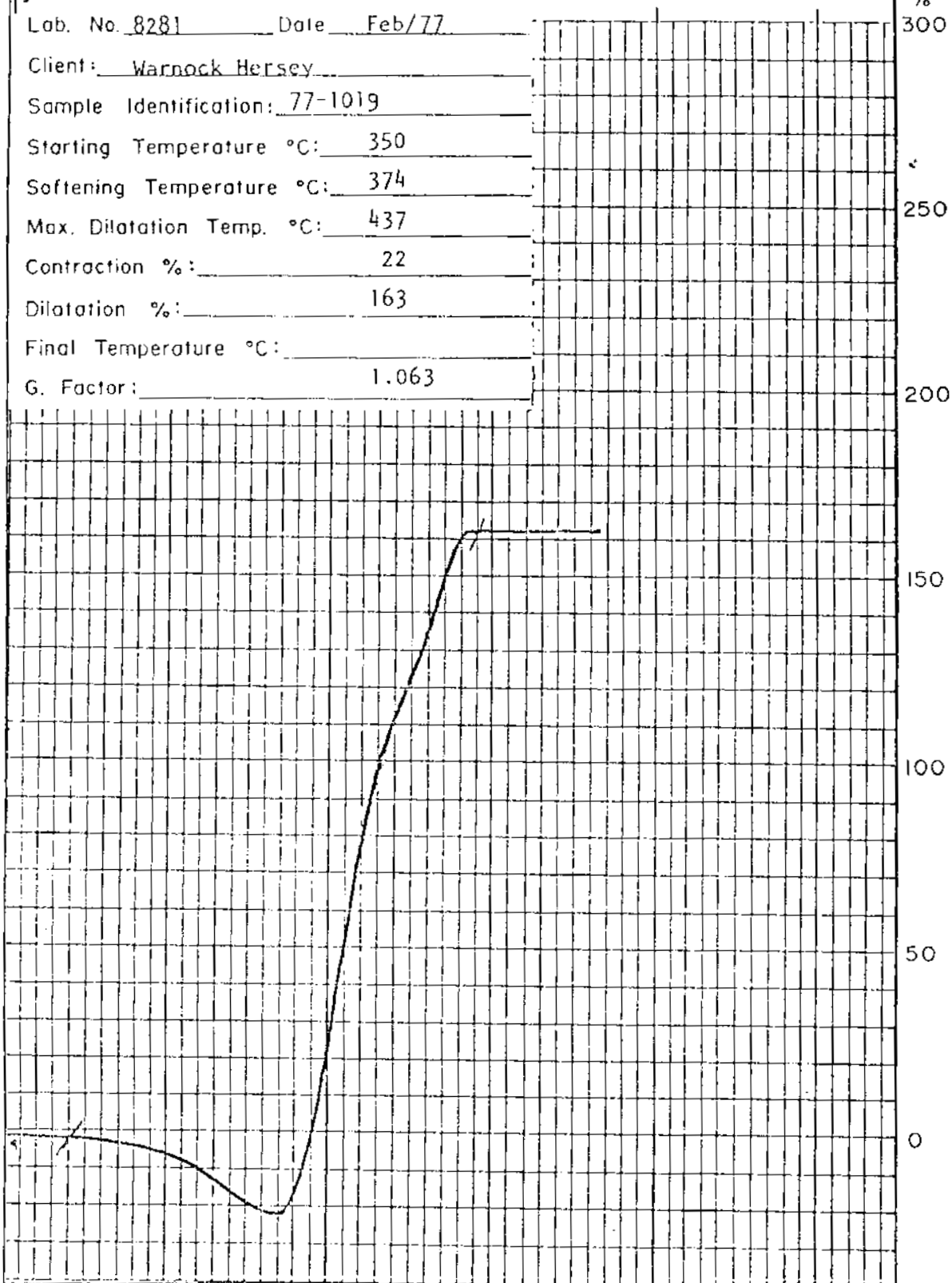
Max. Dilatation Temp. °C: 437

Contraction %: 22

Dilatation %: 163

Final Temperature °C:

G. Factor: 1.063



BIRTLEY ENGINEERING (CANADA) LTD.

Title	Date
RUHR DILATOMETER TEST	
	Drawn

Warnock Hersey Professional Services Ltd.

ELCO MINING LTD — CORE SAMPLE ANALYSIS

Hole No. DH - 25 - 2 Lab. No.: 77 - 1020 Date: February 21, 1977

HEAD RAW ANALYSIS						
R.M.%	Ash%	V.M.%	F.C.%	S.%	H.G.I.	REMARKS
0.9	28.3	23.4	47.4	0.95	130.8'	Air Dried Basis
- - -	29.5	23.6	47.9	0.96	- - -	Dry Basis

SIZE / RAW ANALYSES								
Size Fraction	Wt. %	R.M.%	Ash %	S. %	CUMULATIVE Wt. %	CUMULATIVE Ash %	CUMULATIVE S. %	
¼" x 65m	75.4	0.8	29.6	0.91	75.4	29.6	0.91	A.D.B.
	75.4	- - -	29.8	0.92	75.4	29.8	0.92	D.B.
65m x 0	24.6	0.8	19.5	1.06	100.0	27.1	0.95	A.D.B.
	24.6	- - -	19.7	1.07	100.0	27.3	0.96	D.B.

SINK - FLOAT ANALYSIS: ¼" x 65 M									
S. G.	Wt.%	R.M%	Ash %	V.M%	F.C%	S.%	Cumulative Wt. %	Cumulative Ash %	
-1.40	53.8	0.9	3.9	30.2	65.0	0.86	53.8	3.9	A.D.B.
	53.8	- - -	4.0	30.5	65.5	0.87	53.8	4.0	D.B.
1.40-1.50	5.2	0.9	10.1	27.4	61.6	0.84	59.0	4.4	A.D.B.
	5.2	- - -	10.2	27.7	62.1	0.85	59.0	4.6	D.B.
1.50-1.60	3.8	0.8	18.1	- - -	- - -	- - -	62.8	5.3	A.D.B.
	3.8	- - -	18.2	- - -	- - -	- - -	62.8	5.4	D.B.
+1.60	37.2	0.9	69,3	- - -	- - -	- - -	100.0	29.1	A.D.B.
	37.2	- - -	70.0	- - -	- - -	- -	100.0	29.4	D.B.

COMPOSITE ¼" x 65 m FLOATS @ 1.50 S.G., A.D.B.						
F.S.I.	P % on Coal	DILATATION TESTS Softening Temp. (°C)	Max. Dil. Temp. (°C)	Maximum Contr. %	Maximum Dil. %	G.No.
8½	0.011	362°C	431°C	23%	206%	1.075

Lab. No. 8282 Date Feb/77

Client: Warnock Hersey

Sample Identification: 77-1020

Starting Temperature °C: 350

Softening Temperature °C: 362

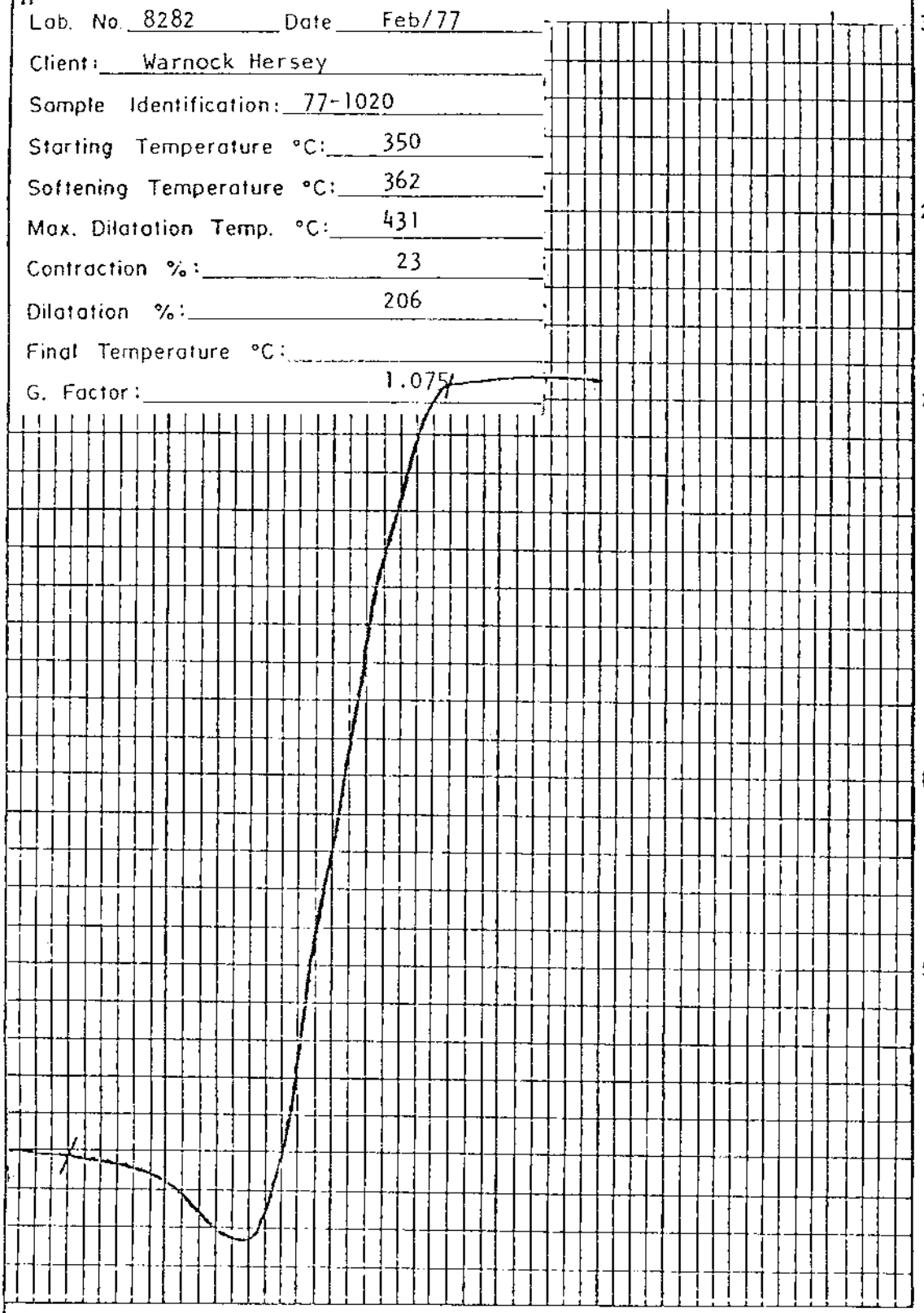
Max. Dilatation Temp. °C: 431

Contraction %: 23

Dilatation %: 206

Final Temperature °C:

G. Factor: 1.075



BIRTLEY ENGINEERING (CANADA) LTD.

Title

RUHR DILATOMETER TEST

Date

Drawn

Warnock Hersey Professional Services Ltd.

ELCO MINING LTD. CORE SAMPLE ANALYSIS

Hole No.: DH - 25 - 3 Lab. No.: 77 - 1021 Date: February 21, 1977

HEAD RAW ANALYSIS						
R.M.%	Ash%	V.M.%	F.C.%	S.%	H.G.I.	REMARKS
0.7	26.3	23.7	49.3	0.80	103.8	Air Dried Basis
- - -	26.5	23.9	49.6	0.81	- - -	Dry Basis

SIZE / RAW ANALYSES								
Size Fraction	Wt. %	R.M.%	Ash %	S. %	CUMULATIVE			
					Wt. %	Ash %	S. %	
¼" x 65m	85.3	0.6	27.8	0.80	85.3	27.8	0.80	A.D.B.
	85.3	- - -	28.0	0.80	85.3	28.0	0.80	D.B.
65m x 0	14.7	0.7	16.2	0.93	100.0	26.1	0.82	A.D.B.
	14.7	- - -	16.3	0.94	100.0	26.3	0.82	D.B.

SINK - FLOAT ANALYSIS: ¼" x 65 M									
S. G.	Wt.%	R.M%	Ash %	V.M%	F.C%	S.%	Cumulative		
							Wt. %	Ash %	
-1.40	52.4	0.8	4.2	34.6	60.4	0.87	52.4	4.2	A.D.B.
	52.4	- - -	4.2	34.9	60.9	0.88	52.4	4.2	D.B.
1.40-1.50	7.0	0.8	14.9	25.1	59.2	0.85	59.4	5.5	A.D.B.
	7.0	- - -	15.0	25.3	59.7	0.86	59.4	5.5	D.B.
1.50-1.60	5.3	0.8	23.2	- - -	- - -	- - -	64.7	6.9	A.D.B.
	5.3	- - -	23.4	- - -	- - -	- - -	64.7	6.9	D.B.
+1.60	35.3	0.8	67.4	- - -	- - -	- - -	100.0	28.3	A.D.B.
	35.3	- - -	67.9	- - -	- - -	- - -	100.0	28.4	D.B.

COMPOSITE ¼" x 65 m FLOATS @ 1.50 S.G., A.D.B.						
F.S.I.	F % on Coal	DILATATION TESTS				
		Softening Temp.(°C)	Max. Dil. Temp.(°C)	Maximum Contr. %	Maximum Dil. %	G.No.
9	0.007	365°C	437°C	19%	256%	1.084

Lab. No. 8283 Date Feb/77

Client: Warnock Hersey

Sample Identification: 77-1021

Starting Temperature °C: 350

Softening Temperature °C: 365

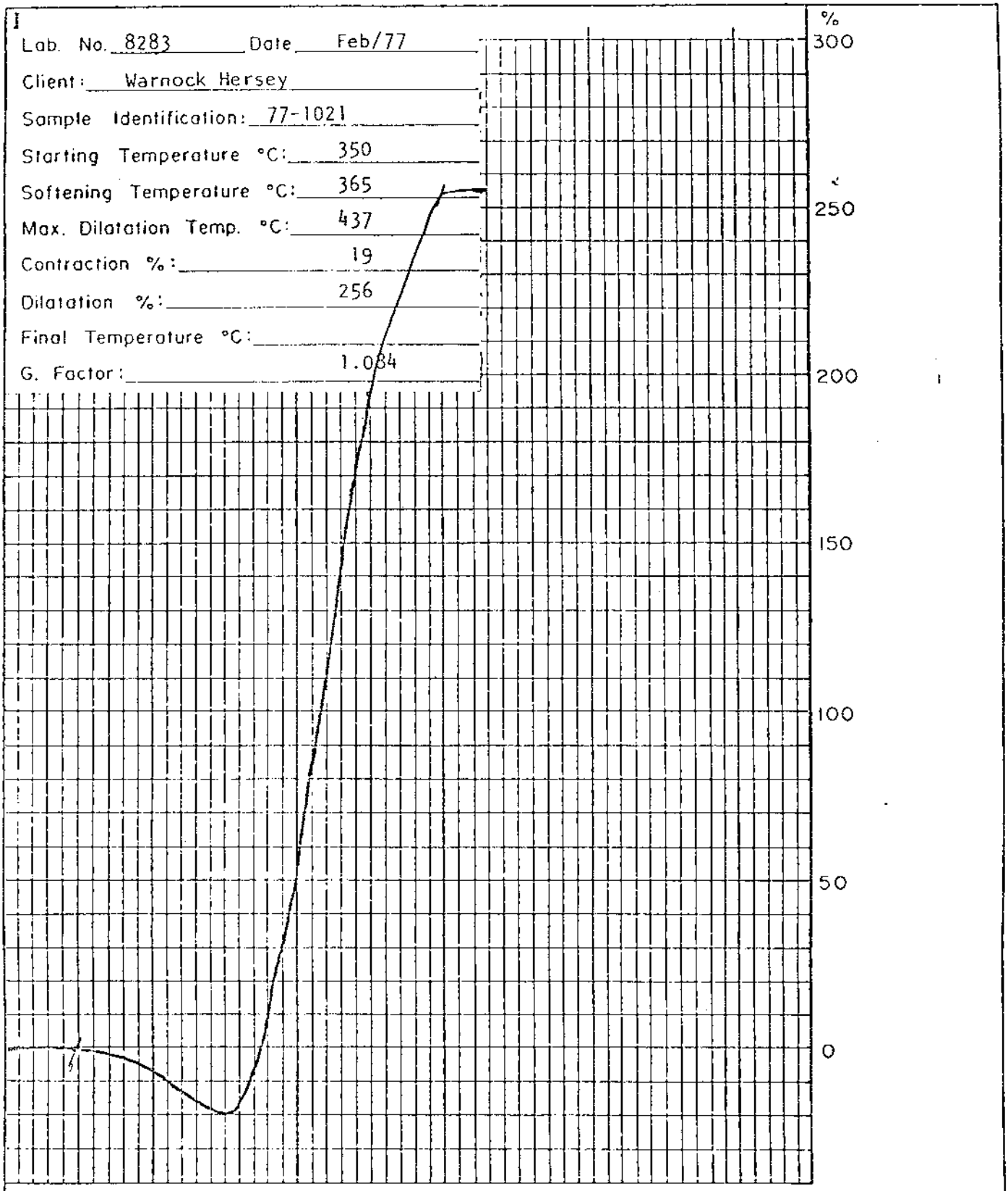
Max. Dilatation Temp. °C: 437

Contraction %: 19

Dilatation %: 256

Final Temperature °C:

G. Factor: 1.084



BIRTLEY ENGINEERING (CANADA) LTD.

Title	Date
RUHR DILATOMETER TEST	
	Drawn

Warnock Hersey Professional Services Ltd.

ELCO MINING LTD. CORE SAMPLE ANALYSIS

Hole No.: DH - 25 - 4 Lab. No.: 77 - 1022 Date: February 21, 1977

HEAD RAW ANALYSIS						
R.M.%	Ash%	V.M.%	F.C %	S.%	H.G.I.	REMARKS
0.7	19.0	24.3	56.0	0.93	105.2	Air Dried Basis
- - -	19.2	24.5	56.3	0.94	- - -	Dry Basis

SIZE / RAW ANALYSES								
Size Fraction	Wt. %	R.M.%	Ash %	S. %	CUMULATIVE			
					Wt. %	Ash %	S. %	
¼" x 65m	83.4	0.6	21.8	0.86	83.4	21.8	0.86	A.D.B.
	83.4	- - -	21.9	0.86	83.4	21.9	0.86	D.B.
65m x 0	16.6	0.7	13.0	0.92	100.0	20.3	0.87	A.D.B.
	16.6	- - -	13.1	0.93	100.0	20.4	0.87	D.B.

SINK - FLOAT ANALYSIS: ¼" x 65 M									
S. G.	Wt.%	R.M%	Ash %	V.M%	F.C%	S.%	Cumulative		
							Wt. %	Ash %	
-1.40	55.3	1.0	4.7	39.1	55.2	1.03	55.3	4.7	A.D.B.
	55.3	- -	4.8	39.6	55.6	1.04	55.3	4.8	D.B.
1.40-1.50	13.2	0.8	15.2	24.0	60.0	0.79	68.5	6.7	A.D.B.
	13.2	- - -	15.3	24.4	60.3	0.80	68.5	6.8	D.B.
1.50-1.60	7.4	0.8	22.4	- -	- - -	- - -	75.9	8.2	A.D.B.
	7.4	- -	22.6	- -	- - -	- - -	75.9	8.4	D.B.
+1.60	24.1	0.8	64.8	- -	- - -	- - -	100.0	21.9	A.D.B.
	24.1	- - -	65.4	- -	- - -	- - -	100.0	22.1	D.B.

COMPOSITE ¼" x 65 m FLOATS @ 1.50 S.G., A.D.B.						
F.S.I.	P % on Coal	DILATATION TESTS				
		Softening Temp. (°C)	Max. Dil. Temp. (°C)	Maximum Contr. %	Maximum Dil. %	G.No.
8½	0.043	368°C	432°C	19%	208%	1.071

Lab. No. 8284 Date Feb/77

Client: Warnock Hersey

Sample Identification: 77-1022

Starting Temperature °C: 350

Softening Temperature °C: 368

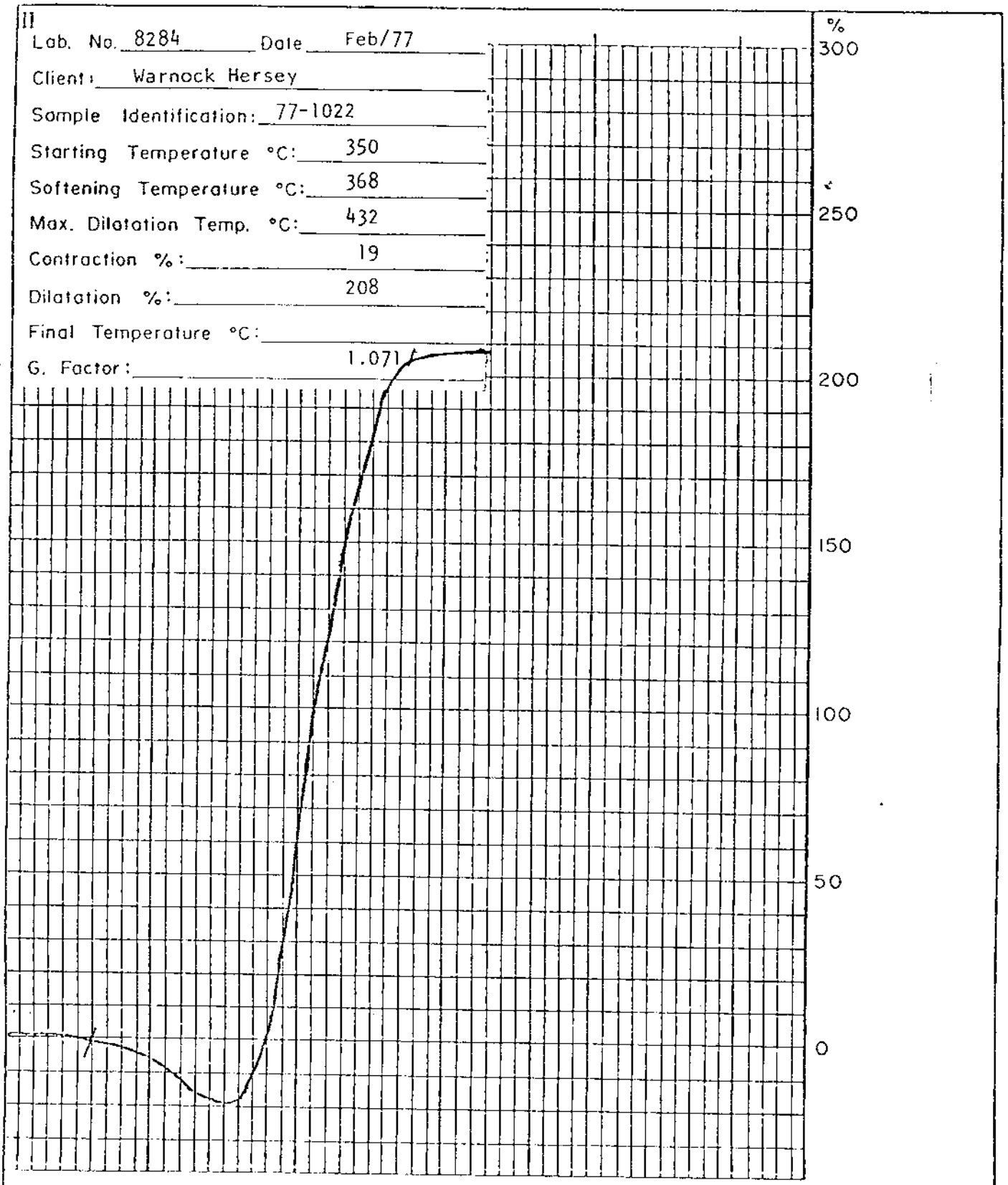
Max. Dilatation Temp. °C: 432

Contraction %: 19

Dilatation %: 208

Final Temperature °C:

G. Factor: 1.071



BIRTLEY ENGINEERING (CANADA) LTD.

Title

RUHR DILATOMETER TEST

Date

Drawn

Warnock Hersey Professional Services Ltd.

ELCO MINING LTD. CORE SAMPLE ANALYSIS

Hole No.: DH 25 - 5 Lab. No.: 77 - 1023 Date: February 21, 1977

HEAD RAW ANALYSIS						
R.M.%	Ash%	V.M.%	F.C %	S.%	H.G.I.	REMARKS
0.9	28.0	22.4	48.7	0.64	91.3	Air Dried Basis
- - -	28.2	22.6	49.2	0.65	- - -	Dry Basis

SIZE / RAW ANALYSES								
Size Fraction	Wt. %	R.M.%	Ash %	S. %	CUMULATIVE			
					Wt. %	Ash %	S. %	
¼" x 65 m	81.3	0.7	29.6	0.65	81.3	29.6	0.65	A.D.B.
	81.3	- - -	29.8	0.65	81.3	29.8	0.65	D.B.
65m x 0	18.7	0.8	18.1	0.68	100.0	27.4	0.66	A.D.B.
	18.7	- - -	18.2	0.68	100.0	27.6	0.66	D.B.

SINK - FLOAT ANALYSIS: ¼" x 65 M									
S. G.	Wt.%	R.M%	Ash %	V.M%	F.C%	S.%	Cumulative		
							Wt. %	Ash %	
-1.40	53.2	0.8	4.1	26.3	68.8	0.78	53.2	4.1	A.D.B.
	53.2	- - -	4.1	26.5	69.4	0.79	53.2	4.1	D.B.
1.40-1.50	5.9	1.0	13.7	24.0	61.3	0.72	59.1	5.0	A.D.B.
	5.9	- - -	13.8	24.3	61.9	0.73	59.1	5.1	D.B.
1.50-1.60	3.9	0.9	23.6	- - -	- - -	- - -	63.0	6.2	A.D.B.
	3.9	- - -	23.9	- - -	- - -	- - -	63.0	6.2	D.B.
+1.60	37.0	0.8	69.9	- - -	- - -	- - -	100.0	29.8	A.D.B.
	37.0	- - -	70.4	- - -	- - -	- - -	100.0	30.0	D.B.

COMPOSITE ¼" x 65 m FLOATS @ 1.50 S.G., A.D.B.						
F.S.I.	P % on Coal	DILATATION TESTS				
		Softening Temp.(°C)	Max. Dil. Temp.(°C)	Maximum Contr. %	Maximum Dil. %	G.No.
8½	0.022	368°C	437°C	22%	132%	1.065

Lab. No. 8285 Date Feb/77

Client: Warnock Hersey

Sample Identification: 77-1023

Starting Temperature °C: 350

Softening Temperature °C: 368

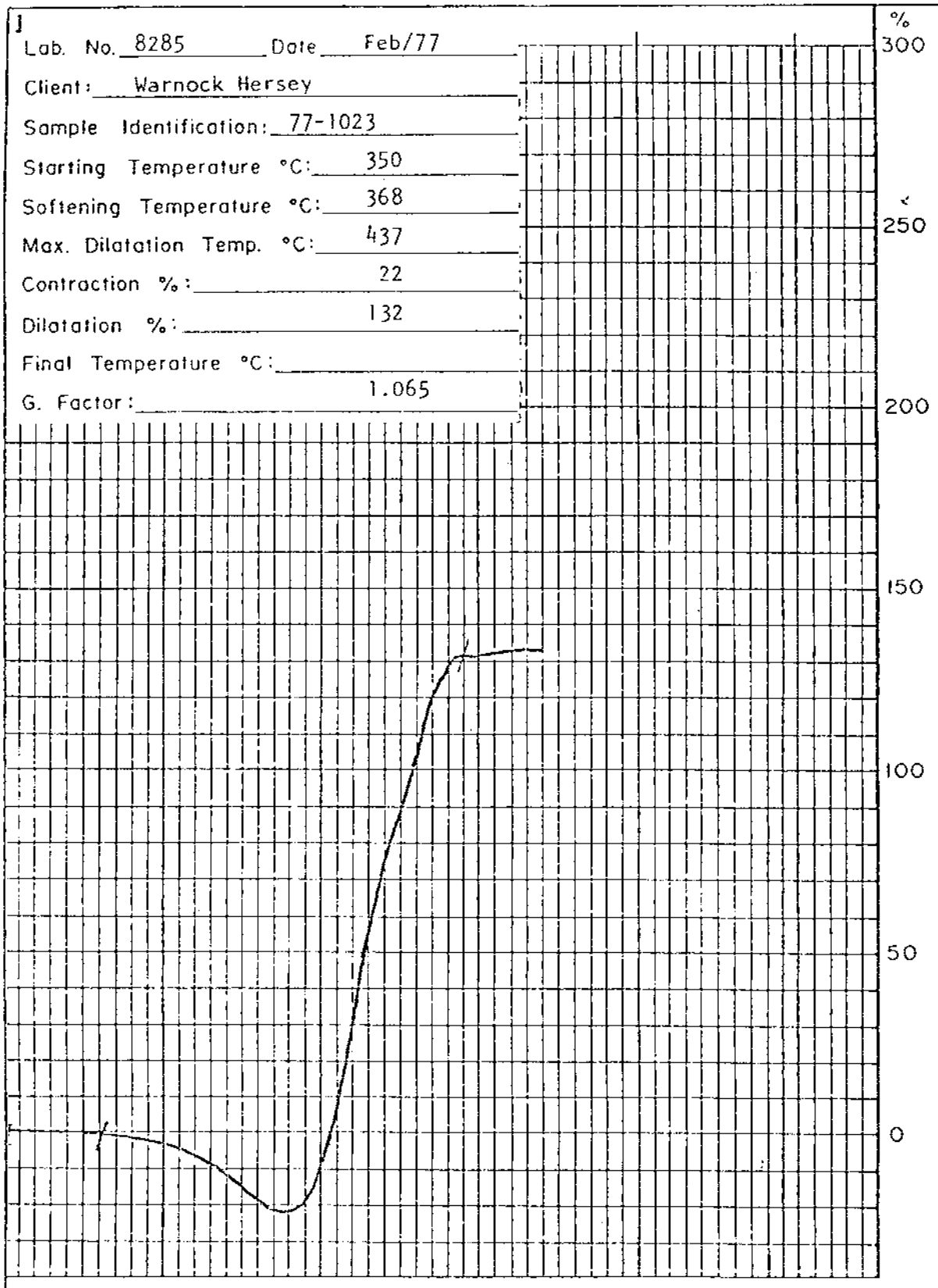
Max. Dilatation Temp. °C: 437

Contraction %: 22

Dilatation %: 132

Final Temperature °C:

G. Factor: 1.065



BIRTLEY ENGINEERING (CANADA) LTD.

Title	Date
RUHR DILATOMETER TEST	
	Drawn

Warnock Hersey Professional Services Ltd.

ELCO MINING LTD. CORE SAMPLE ANALYSIS

Hole No.: DH - 25 - 6 Lab. No.: 77 - 1024 Date: February 21, 1977

HEAD RAW ANALYSIS						
R.M.%	Ash%	V.M.%	F.C.%	S.%	H.G.I.	REMARKS
0.8	28.8	20.4	50.0	0.64	98.2	Air Dried Basis
- - -	29.1	20.6	50.3	0.64	- - -	Dry Basis

SIZE / RAW ANALYSES								
Size Fraction	Wt. %	R.M.%	Ash %	S. %	CUMULATIVE Wt. %	CUMULATIVE Ash %	CUMULATIVE S. %	
¼" x 65 m	85.5	0.6	31.2	0.62	85.5	31.2	0.62	A.D.B.
	85.5	- - -	31.4	0.62	85.5	31.4	0.62	D.B.
65m x 0	14.5	0.6	18.6	0.78	100.0	29.4	0.64	A.D.B.
	14.5	- - -	18.7	0.78	100.0	29.6	0.64	D.B.

SINK - FLOAT ANALYSIS: ¼" x 65 M									
S. G.	Wt.%	R.M%	Ash %	V.M%	F.C%	S.%	Cumulative Wt. %	Cumulative Ash %	
-1.40	48.0	0.7	3.6	29.6	66.1	0.90	48.0	3.6	A.D.B.
	48.0	- - -	3.6	29.8	66.6	0.91	48.0	3.6	D.B.
1.40-1.50	7.2	0.7	10.9	24.1	64.3	0.81	55.2	4.6	A.D.B.
	7.2	- - -	11.0	24.3	64.7	0.82	55.2	4.6	D.B.
1.50-1.60	3.9	0.8	24.7	- - -	- - -	- - -	59.1	5.9	A.D.B.
	3.9	- - -	24.9	- - -	- - -	- - -	59.1	5.9	D.B.
+1.60	40.9	0.9	67.1	- - -	- - -	- - -	100.0	30.9	A.D.B.
	40.9	- - -	67.7	- - -	- - -	- - -	100.0	31.2	D.B.

COMPOSITE ¼" x 65 m FLOATS @ 1.50 S.G., A.D.B.						
F.S.I.	P % on Coal	DILATATION TESTS Softening Temp. (°C)	Max. Dil. Temp. (°C)	Maximum Contr. %	Maximum Dil. %	G.No.
9	0.035	374°C	437°C	19%	237%	1.071

Lab. No. 8286 Date Feb/77

Client: Warnock Hersey

Sample Identification: 77-1024

Starting Temperature °C: 350

Softening Temperature °C: 374

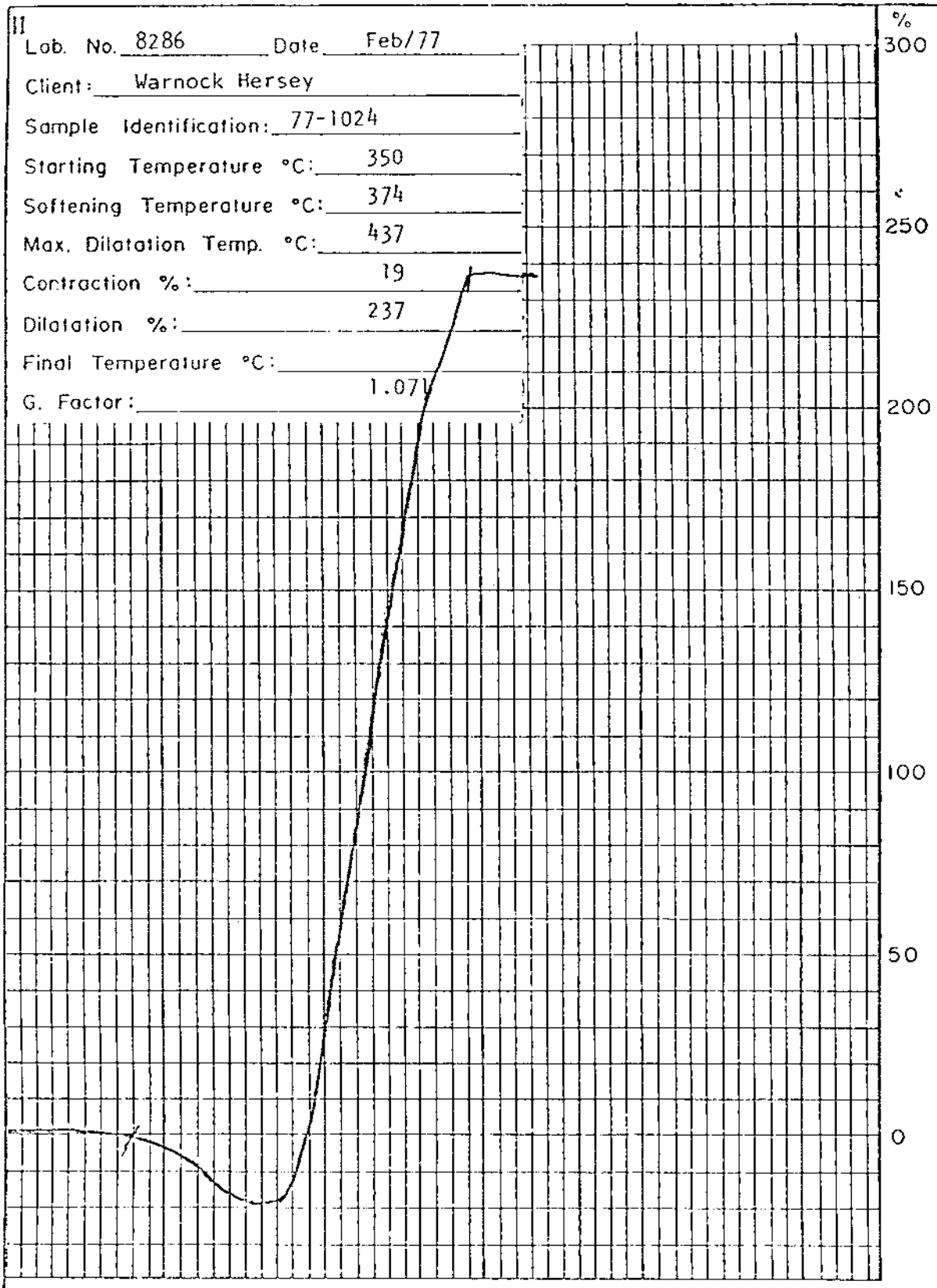
Max. Dilatation Temp. °C: 437

Contraction %: 19

Dilatation %: 237

Final Temperature °C:

G. Factor: 1.07



BIRTLEY ENGINEERING (CANADA) LTD.

Title

RUHR DILATOMETER TEST

Date

Drawn

Warnock Hersey Professional Services Ltd.

ELCO MINING LTD. CORE SAMPLE ANALYSIS

Hole No.: DH - 25 - 7 Lab. No.: 77 - 1025 Date: February 21, 1977

HEAD RAW ANALYSIS						
R.M.%	Ash%	V.M.%	F.C.%	S.%	H.G.I.	REMARKS
0.7	25.8	22.0	51.5	0.59	98.2	Air Dried Basis
- - -	26.0	22.2	51.8	0.59	- - -	Dry Basis

SIZE / RAW ANALYSES								
Size Fraction	Wt. %	R.M.%	Ash %	S. %	CUMULATIVE			
					Wt. %	Ash %	S. %	
¼" x 65m	83.0	0.6	27.9	0.59	83.0	27.9	0.59	A.D.B.
	83.0	- - -	28.1	0.59	83.0	28.1	0.59	D.B.
65m x 0	17.0	0.6	13.0	0.68	100.0	25.4	0.60	A.D.B.
	17.0	- - -	13.1	0.68	100.0	25.6	0.60	D.B.

SINK - FLOAT ANALYSIS: ¼" x 65 M									
S. G.	Wt.%	R.M%	Ash %	V.M%	F.C%	S.%	Cumulative		
							Wt. %	Ash %	
-1.40	57.5	0.8	3.9	27.0	68.3	0.77	57.5	3.9	A.D.B.
	57.5	- - -	3.9	27.2	68.9	0.78	57.5	3.9	D.B.
1.40-1.50	5.0	0.7	13.4	25.2	60.7	0.73	62.5	4.7	A.D.B.
	5.0	- - -	13.5	25.3	61.2	0.74	62.5	4.7	D.B.
1.50-1.60	4.1	0.9	23.6	- - -	- - -	- - -	66.6	5.8	A.D.B.
	4.1	- - -	23.8	- - -	- - -	- - -	66.6	5.8	D.B.
+1.60	33.4	0.9	70.1	- - -	- - -	- - -	100.0	27.3	A.D.B.
	33.4	- - -	70.7	- - -	- - -	- - -	100.0	27.5	D.B.

COMPOSITE ¼" x 65 m FLOATS @ 1.50 S.G., A.D.B.						
F.S.I.	F % on Coal	DILATATION TESTS				
		Softening Temp. (°C)	Max. Dil. Temp. (°C)	Maximum Contr. %	Maximum Dil. %	G.No.
9	0.022	368°C	437°C	20%	229%	1.078

1

Lab. No. 8287 Date Feb/77

Client: Warnock Hersey

Sample Identification: 77-1025

Starting Temperature °C: 350

Softening Temperature °C: 368

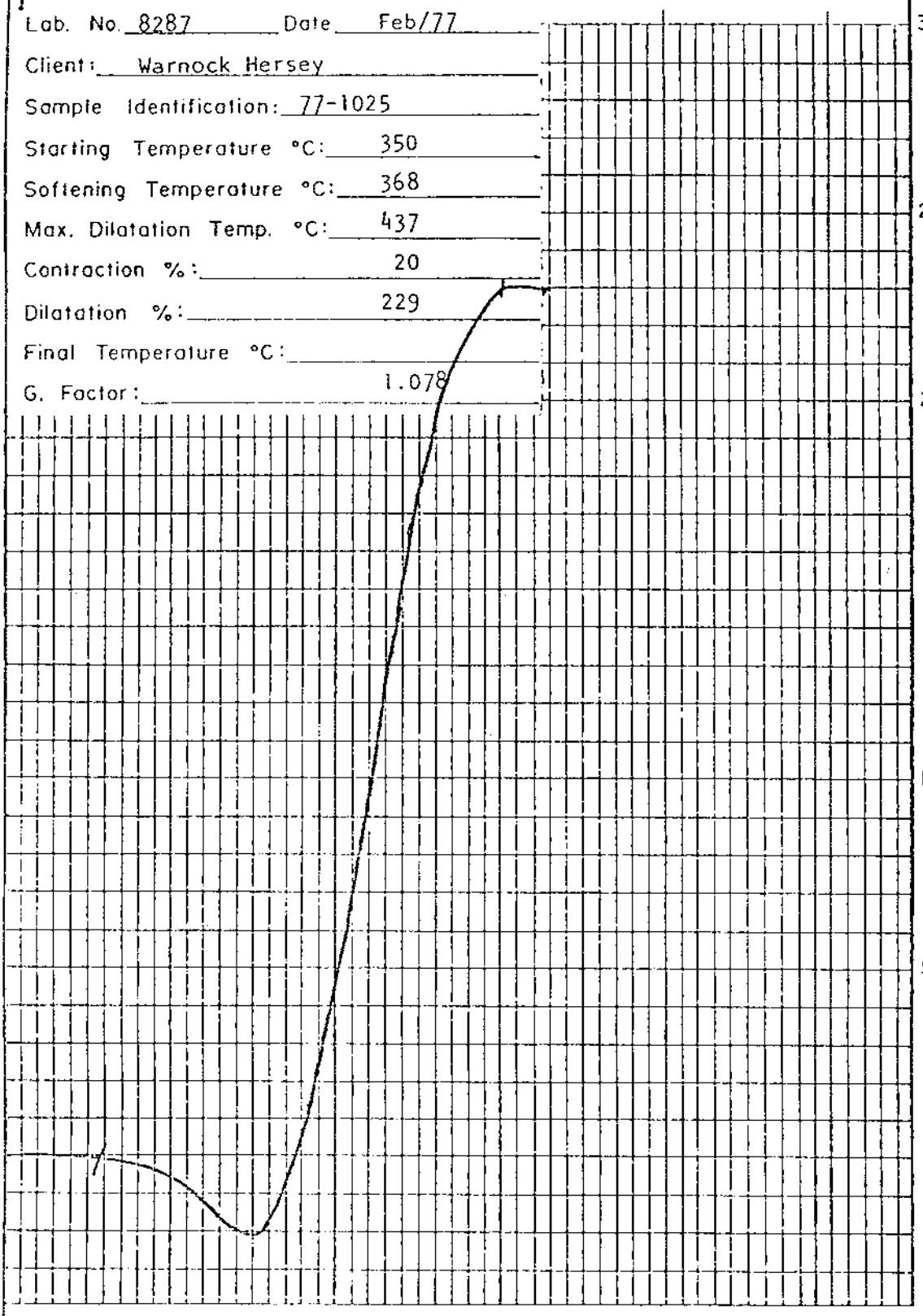
Max. Dilatation Temp. °C: 437

Contraction %: 20

Dilatation %: 229

Final Temperature °C:

G. Factor: 1.078



BIRTLEY ENGINEERING (CANADA) LTD.

Title	Date
RUHR DILATOMETER TEST	
	Drawn

Warnock Hersey Professional Services Ltd.

ELCO MINING LTD. CORE SAMPLE ANALYSIS

Hole No.: DH - 25 - 8 Lab. No.: 77 - 1026 Date: February 21, 1977

HEAD RAW ANALYSIS						
R.M.%	Ash%	V.M.%	F.C.%	S.%	H.G.I.	REMARKS
0.6	17.8	23.8	57.8	0.85	96.2	Air Dried Basis
- - -	17.9	24.0	58.1	0.86	- - -	Dry Basis

SIZE / RAW ANALYSES								
Size Fraction	Wt. %	R.M.%	Ash %	S. %	CUMULATIVE			
					Wt. %	Ash %	S. %	
¼" x 65 m	84.8	0.5	17.7	0.79	84.8	17.7	0.79	A.D.B.
	84.8	- - -	17.8	0.79	84.8	17.8	0.79	D.B.
65m x 0	15.2	0.6	12.4	0.85	100.0	16.9	0.80	A.D.B.
	15.2	- - -	12.5	0.85	100.0	17.0	0.80	D.B.

SINK - FLOAT ANALYSIS: ¼" x 65 M									
S. G.	Wt.%	R.M%	Ash %	V.M%	F.C%	S.%	Cumulative		
							Wt. %	Ash %	
-1.40	71.7	0.6	5.0	26.6	67.8	0.92	71.7	5.0	A.D.B.
	71.7	- - -	5.1	26.8	68.1	0.93	71.7	5.1	D.B.
1.40-1.50	9.1	0.6	14.8	24.3	60.9	0.83	80.8	6.1	A.D.B.
	9.1	- - -	14.9	24.4	60.7	0.84	80.8	6.2	D.B.
1.50-1.60	3.7	0.9	24.2	- - -	- - -	- -	84.5	6.9	A.D.B.
	3.7	- - -	24.5	- - -	- - -	- -	84.5	7.0	D.B.
+1.60	15.5	1.0	72.1	- - -	- - -	- -	100.0	17.0	A.D.B.
	15.5	- - -	72.8	- - -	- - -	- -	100.0	17.2	D.B.

COMPOSITE ¼" x 65 m FLOATS @ 1.50 S.G., A.D.B.						
F.S.I.	P % on Coal	DILATATION TESTS				
		Softening Temp.(°C)	Max. Dil. Temp.(°C)	Maximum Contr. %	Maximum Dil. %	G.No.
8½	0.035	362°C	437°C	21%	290%	1.088

Lab. No. 8288 Date Feb/77

Client: Warnock Hersey

Sample Identification: 77-1026

Starting Temperature °C: 350

Softening Temperature °C: 362

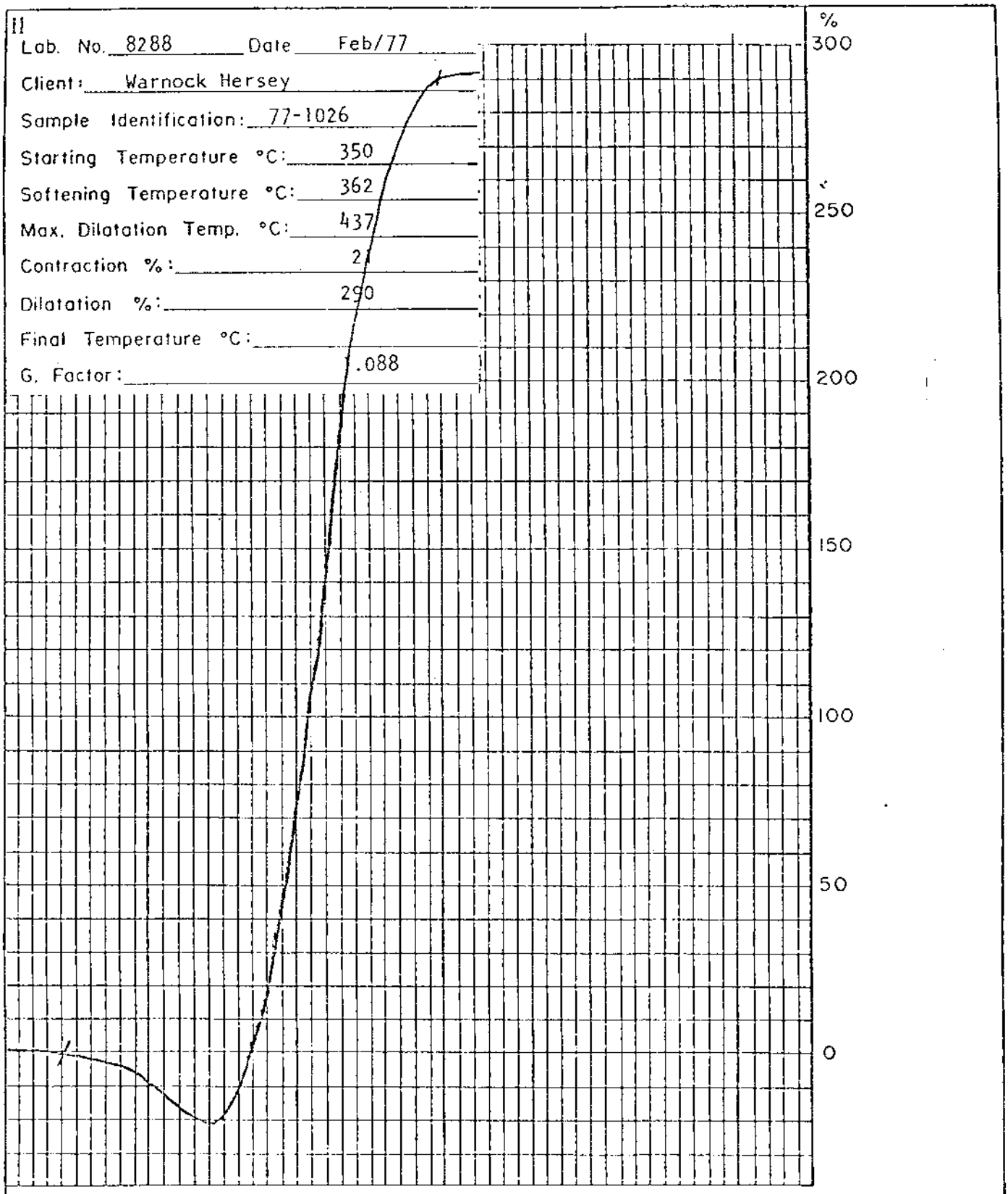
Max. Dilatation Temp. °C: 437

Contraction %: 2

Dilatation %: 290

Final Temperature °C:

G. Factor: .088



BIRTLEY ENGINEERING (CANADA) LTD.

Title	Date
RUHR DILATOMETER TEST	
	Drawn

Warnock Hersey Professional Services Ltd.

ELCO MINING LTD. CORE SAMPLE ANALYSIS

Hole No.: DH - 25 - 9 Lab. No.: 77 - 1027 Date: February 21, 1977

HEAD RAW ANALYSIS						
R.M.%	Ash%	V.M.%	F.C.%	S.%	H.G.I.	REMARKS
0.7	25.9	21.3	52.1	1.02	80.2	Air Dried Basis
- - -	26.0	21.4	52.6	1.03	- - -	Dry Basis

SIZE / RAW ANALYSES								
Size Fraction	Wt. %	R.M.%	Ash %	S. %	CUMULATIVE			
					Wt. %	Ash %	S. %	
¼" x 65 m	76.2	0.6	29.0	1.01	76.2	29.0	1.01	A.D.B.
	76.2	0- -	29.2	10.2	76.2	29.2	1.02	D.B.
65m x0	23.8	0.6	11.6	10.6	100.0	24.9	1.02	A.D.B.
	23.8	- - -	11.7	10.7	100.0	25.0	1.03	D.B.

SINK - FLOAT ANALYSIS: ¼" x 65 M									
S. G.	Wt.%	R.M%	Ash %	V.M%	F.C%	S.%	Cumulative		
							Wt. %	Ash %	
-1.40	50.6	0.7	3.3	27.1	68.9	1.02	50.6	3.3	A.D.B.
	50.6	- - -	3.4	27.3	69.3	1.03	50.6	3.4	D.B.
1.40-1.50	5.7	0.7	9.1	26.3	63.9	0.79	56.3	3.9	A.D.B.
	5.7	- - -	9.2	26.5	64.3	0.80	56.3	4.0	D.B.
1.50-1.60	4.4	0.9	16.1	- - -	- - -	- - -	60.7	4.8	A.D.B.
	4.4	- - -	16.2	- - -	- - -	- --	60.7	4.9	D.B.
+1.60	39.3	0.9	67.9	- - -	- - -	- --	100.0	29.6	A.D.B.
	39.3	- - -	68.5	- --	- - -	- - -	100.0	29.9	D.B.

COMPOSITE ¼" x 65 m FLOATS @ 1.50 S.G., A.D.B.						
F.S.I.	P % on Coal	DILATATION TESTS				
		Softening Temp.(°C)	Max. Dil. Temp.(°C)	Maximum Contr. %	Maximum Dil. %	G.No.
8½	0.009	377°C	437°C	13%	187%	1.069

Lab. No. 8289 Date Feb/77

Client: Warnock Hersey

Sample Identification: 77-1027

Starting Temperature °C: 350

Softening Temperature °C: 377

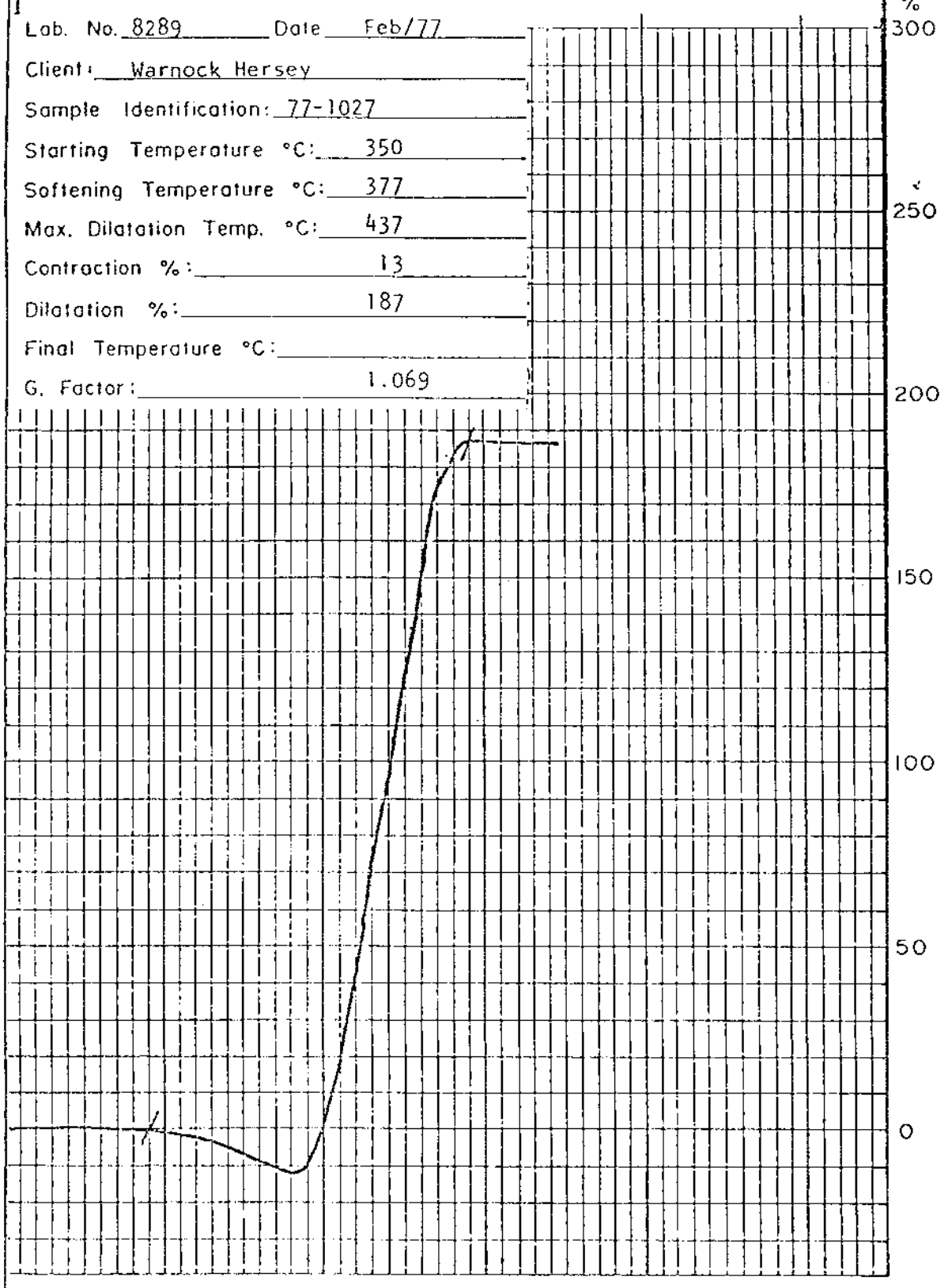
Max. Dilatation Temp. °C: 437

Contraction %: 13

Dilatation %: 187

Final Temperature °C:

G. Factor: 1.069



BIRTLEY ENGINEERING (CANADA) LTD.

Title

RUHR DILATOMETER TEST

Date

Drawn

ELCO MINING LTD.

CORE SAMPLE ANALYSIS

HOLE NO.: DH-26-1 Lab. No. 8202 DATE: Jan. 19/77

HEAD RAW ANALYSIS						
R.M. %	ASH %	V.M. %	F.C. %	S. %	H.G.I.	REMARKS
0.7	19.0	24.6	55.7	0.74	75	Air Dried Basis
	19.1	24.8	56.1	0.75	--	Dry Basis

SIZE / RAW ANALYSES								
SIZE FRACTION	WT. %	R.M. %	ASH %	S. %	CUMULATIVE WT. %	CUMULATIVE ASH %	CUMULATIVE S. %	
1/4" x 65M	94.2	0.8	19.8	0.76	94.2	19.8	0.76	A.D.B.
	94.2		20.0	0.77	94.2	20.0	0.77	D.B.
65M x 0	5.8	0.8	14.3	0.78	100.0	19.5	0.76	A.D.B.
	5.8		14.4	0.79	100.0	19.7	0.77	D.B.

SINK - FLOAT ANALYSIS: 1/4" x 65M									
S. G.	WT. %	R.M. %	ASH %	V.M. %	F.C. %	S. %	CUMULATIVE WT. %	CUMULATIVE ASH %	
-1.40	71.1	0.8	4.5	26.6	68.1	0.82	71.1	4.5	A.D.B.
	71.1		4.5	26.8	68.7	0.83	71.1	4.5	D.B.
1.40-1.50	6.3	0.8	22.1	23.3	53.8	0.67	77.4	5.9	A.D.B.
	6.3		22.3	23.5	54.2	0.68	77.4	5.9	D.B.
1.50-1.60	2.7	0.8	30.1				80.1	6.7	A.D.B.
	2.7		30.3				80.1	6.8	D.B.
+1.60	19.9	0.9	71.5				100.0	19.6	A.D.B.
	19.9		72.1				100.0	19.8	D.B.

COMPOSITE 1/4" x 65M FLOATS @ 1.50 S.G., A.D.B.						
F.S.I.	P% ON COAL	DILATATION TEST				
		SOFTENING TEMP. (°C)	MAX. DIL. TEMP. (°C)	MAXIMUM CONTR. %	MAXIMUM DIL. %	G. NO.
7	.10	371	440	19	97	1.061

Birtley Engineering

Subsidiary of Great West Steel Industries

Lab. No. 8202 Date Jan 28, 1977

Client: ELCO MINING LTD.

Sample Identification: DH-26-1

Starting Temperature °C: 350

Softening Temperature °C: 371

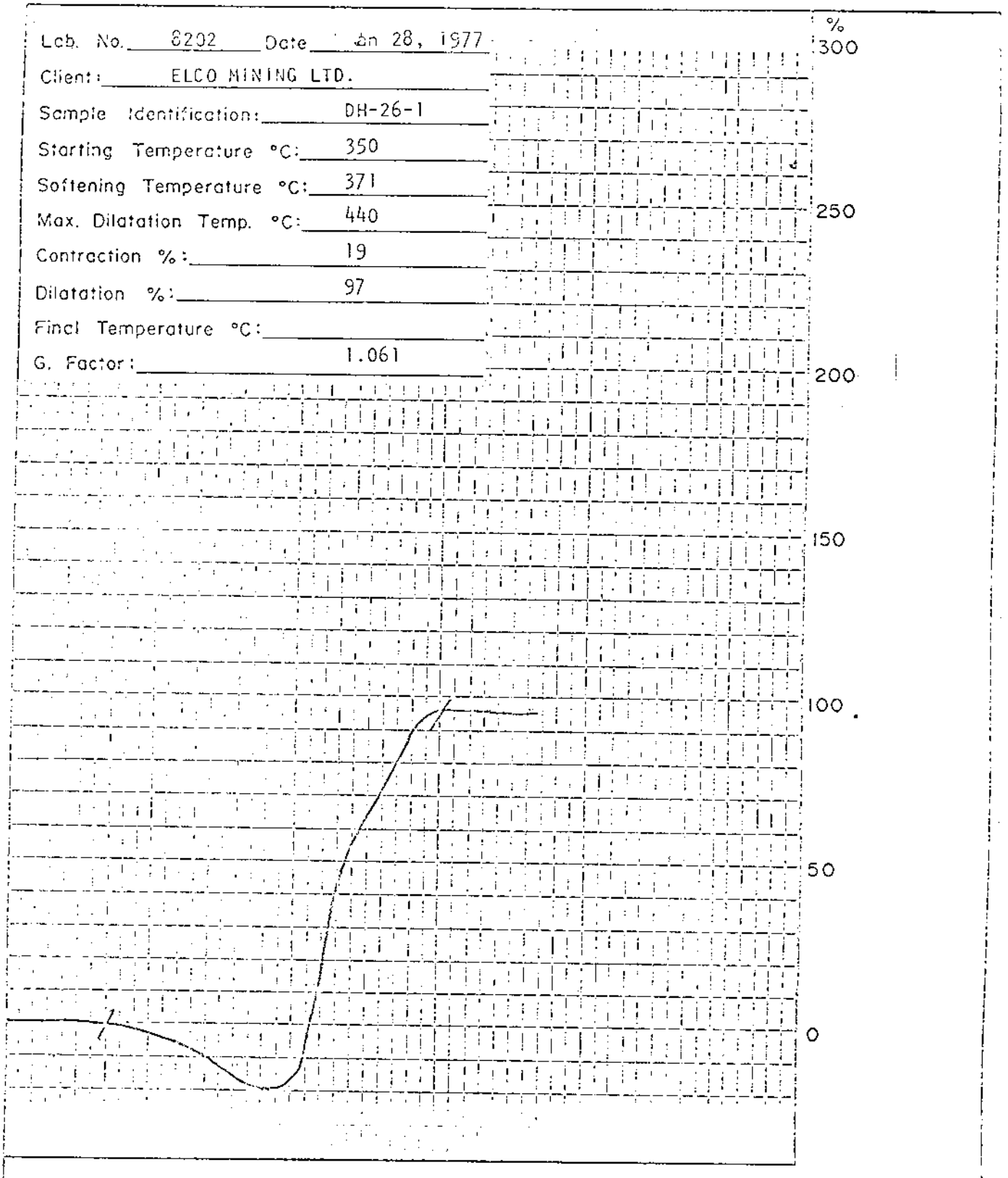
Max. Dilatation Temp. °C: 440

Contraction %: 19

Dilatation %: 97

Final Temperature °C:

G. Factor: 1.061



BIRTLEY ENGINEERING (CANADA) LTD.

Title

RUHR DILATOMETER TEST

Date

Drawn

ELCO MINING LTD.

CORE SAMPLE ANALYSIS

HOLE NO.: DH-26-2 Lab. No. 8203 DATE: Jan/77

HEAD RAW ANALYSIS						
R.M. %	ASH %	V.M. %	F.C. %	S. %	H.G.I.	REMARKS
0.8	17.9	25.4	55.9	0.94	116	Air Dried Basis
	18.0	25.6	56.4	0.95	---	Dry Basis

SIZE/RAW ANALYSES								
SIZE FRACTION	WT. %	R.M. %	ASH %	S. %	CUMULATIVE WT. %	CUMULATIVE ASH %	CUMULATIVE S. %	
1/4" x 65M	91.5	0.8	18.8	0.91	91.5	18.8	0.91	A.D.B.
	91.5		20.0	0.92	91.5	20.0	0.92	D.B.
65M x 0	8.5	0.9	15.5	1.06	100.0	18.5	0.92	A.D.B.
	8.5		15.6	1.07	100.0	19.6	0.93	D.B.

SINK-FLOAT ANALYSIS: 1/4" x 65M									
S. G.	WT. %	R.M. %	ASH %	V.M. %	F.C. %	S. %	CUMULATIVE WT. %	CUMULATIVE ASH %	
-1.40	69.8	0.7	5.6	28.4	65.3	0.92	69.8	5.6	A.D.B.
	69.9		5.6	28.6	65.8	0.93	69.9	5.6	D.B.
1.40-1.50	6.5	0.7	21.8	25.0	52.5	0.89	76.3	7.0	A.D.B.
	6.5		22.0	25.2	52.8	0.90	76.4	7.0	D.B.
1.50-1.60	5.2	0.7	31.6				81.5	8.6	A.D.B.
	5.2		31.8				81.6	8.6	D.B.
+1.60	18.5	0.9	66.3				100.0	19.2	A.D.B.
	18.4		66.9				100.0	19.3	D.B.

COMPOSITE 1/4" x 65M FLOATS @ 1.50 S.G., A.D.B.						
F.S.I.	P% ON COAL	DILATATION TEST				
		SOFTENING TEMP. (°C)	MAX. DIL. TEMP. (°C)	MAXIMUM CONTR. %	MAXIMUM DIL. %	G. NO.
7 1/2	.07	365	439	21	202	1.081

Birtley Engineering

Subsidiary of Great West Steel Industries

Lab. No. 8203 Date Jan 28, 1977

Client: ELCO MINING LTD.

Sample Identification: DH-26-2

Starting Temperature °C: 350

Softening Temperature °C: 365

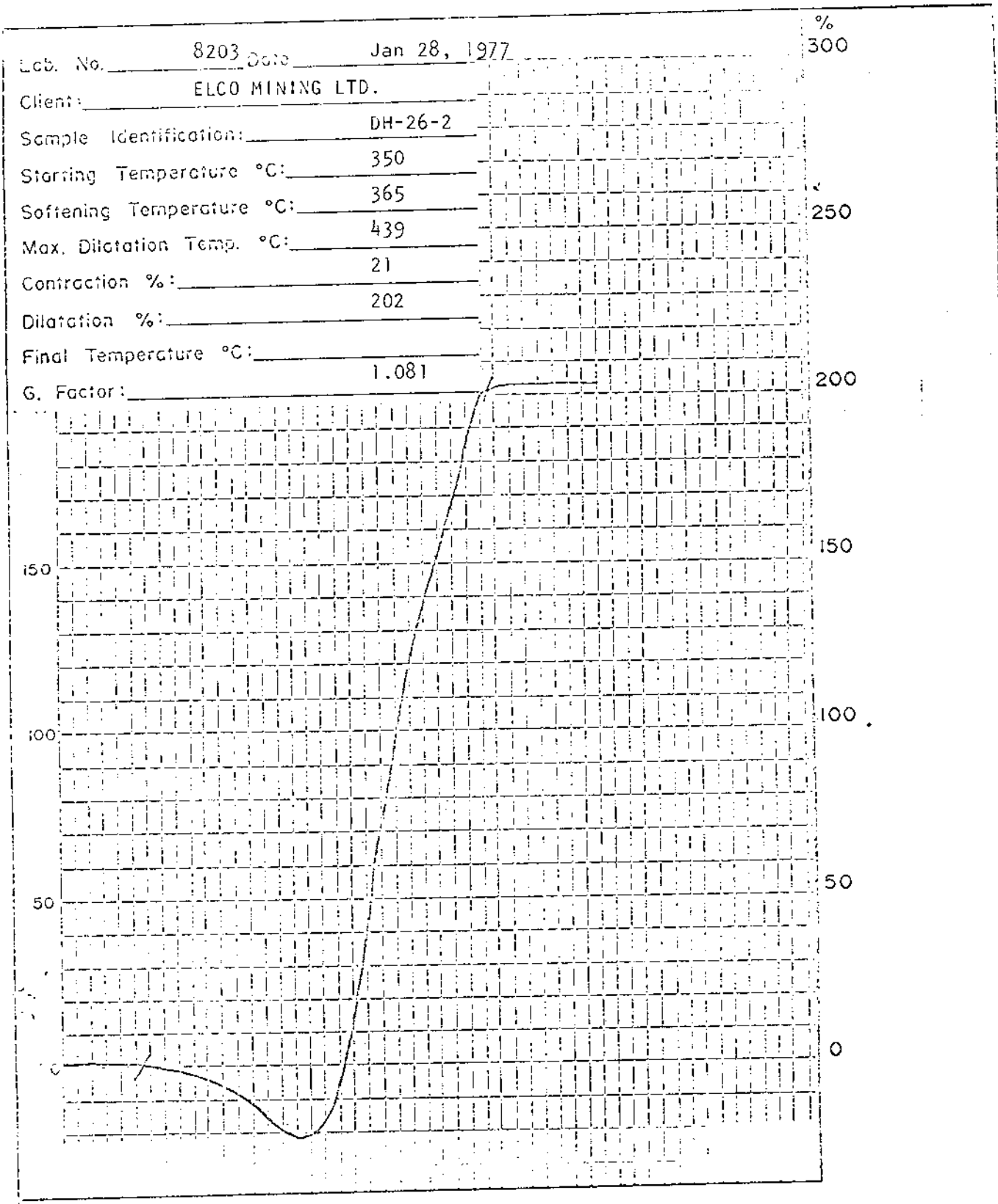
Max. Dilatation Temp. °C: 439

Contraction %: 21

Dilatation %: 202

Final Temperature °C:

G. Factor: 1.081



BARTLEY ENGINEERING (CANADA) LTD.

Title

RUHR DILATOMETER TEST

Date

Drawn

ELCO MINING LTD.

CORE SAMPLE ANALYSIS

HOLE NO.: DH-26-3 Lab. No. 8204 DATE: Jan/77

HEAD RAW ANALYSIS						
R.M. %	ASH %	V.M. %	F.C. %	S. %	H.G.I.	REMARKS
0.8	10.2	25.9	63.1	0.90	87	Air Dried Basis
	10.3	26.1	63.6	0.91	--	Dry Basis

SIZE/RAW ANALYSES								
SIZE FRACTION	WT. %	R.M. %	ASH %	S. %	CUMULATIVE WT. %	CUMULATIVE ASH %	CUMULATIVE S. %	
1/4" x 65M	88.1	1.3	9.7	0.94	88.1	9.7	0.94	A.D.B.
	88.1		9.8	0.95	88.1	9.8	0.95	D.B.
65M x 0	11.9	0.8	13.7	0.87	100.0	10.2	0.93	A.D.B.
	11.9		13.8	0.88	100.0	10.3	0.94	D.B.

SINK-FLOAT ANALYSIS: 1/4" x 65M									
S. G.	WT. %	R.M. %	ASH %	V.M. %	F.C. %	S. %	CUMULATIVE WT. %	CUMULATIVE ASH %	
-1.40	86.2	2.1	4.2	27.6	66.1	0.92	86.2	4.2	A.D.B.
	86.1		4.3	28.2	67.5	0.94	86.1	4.3	D.B.
1.40-1.50	3.7	0.9	18.8	23.0	57.3	0.82	89.9	4.8	A.D.B.
	3.7		19.0	23.2	57.8	0.83	89.8	4.9	D.B.
1.50-1.60	2.0	0.9	30.4				91.9	5.4	A.D.B.
	2.0		30.7				91.8	5.5	D.B.
+1.60	8.1	1.2	56.5				100.0	9.5	A.D.B.
	8.2		57.2				100.0	9.7	D.B.

COMPOSITE 1/4" x 65M FLOATS @ 1.50 S.G., A.D.B.						
F.S.I.	P2 ON COAL	DILATATION TEST				
		SOFTENING TEMP. (°C)	MAX. DIL. TEMP. (°C)	MAXIMUM CONTR. %	MAXIMUM DIL. %	G. NO.
7 1/2	.09	368	434	22	147	1.062

Birtley Engineering

Subsidiary of Great West Steel Industries

Lab. No. 8204 Date Jan 28, 1977

Client: ELCO MINING LTD.

Sample Identification: DH-26-3

Starting Temperature °C: 350

Softening Temperature °C: 368

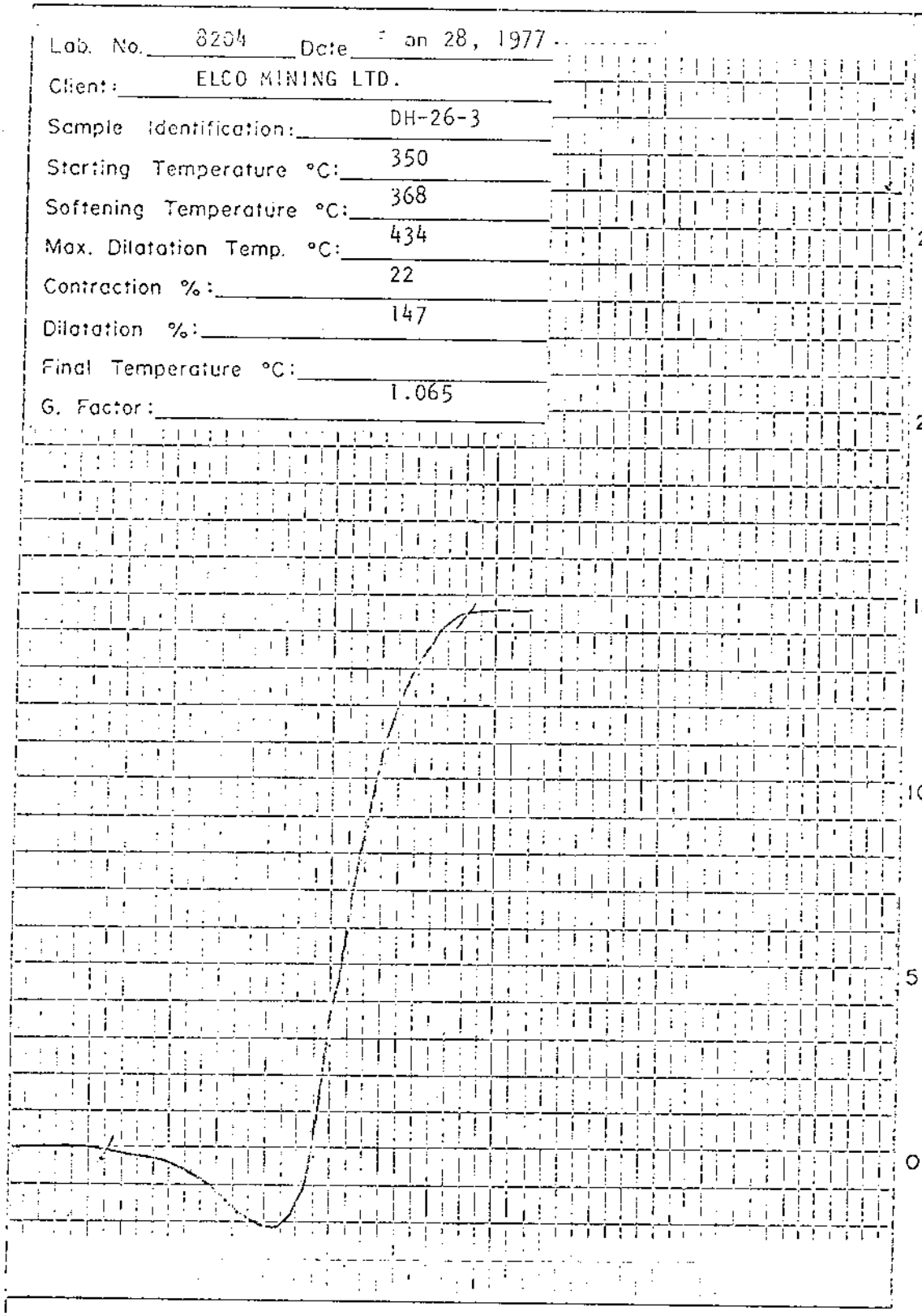
Max. Dilatation Temp. °C: 434

Contraction %: 22

Dilatation %: 147

Final Temperature °C:

G. Factor: 1.065



BIRTLEY ENGINEERING (CANADA) LTD.

Title

RUHR DILATOMETER TEST

Date

Drawn

ELCO MINING LTD.

CORE SAMPLE ANALYSIS

HOLE NO.: DH-26-4 Lab. No. 8205 DATE: Jan/77

HEAD RAW ANALYSIS						
R.M. %	ASH %	V.M. %	F.C. %	S. %	H.G.I.	REMARKS
1.2	7.8	25.7	65.3	1.07	78	Air Dried Basis
	7.9	26.0	66.1	1.08	--	Dry Basis

SIZE / RAW ANALYSES								
SIZE FRACTION	WT. %	R.M. %	ASH %	S. %	CUMULATIVE WT. %	CUMULATIVE ASH %	CUMULATIVE S. %	
1/4" x 65M	94.7	0.8	7.7	1.10	94.7	7.7	1.10	A.D.B.
	94.7		7.8	1.11	94.7	7.8	1.11	D.B.
65M x 0	5.3	1.5	11.2	1.04	100.0	7.9	1.10	A.D.B.
	5.3		11.4	1.06	100.0	8.0	1.11	D.B.

SINK - FLOAT ANALYSIS: 1/4" x 65M									
S. G.	WT. %	R.M. %	ASH %	V.M. %	F.C. %	S. %	CUMULATIVE WT. %	CUMULATIVE ASH %	
-1.40	83.6	0.8	3.8	26.2	69.2	1.08	83.6	3.8	A.D.B.
	83.6		3.8	26.4	69.8	1.09	83.6	3.8	D.B.
1.40-1.50	9.2	0.8	18.2	21.2	59.8	0.82	92.8	5.2	A.D.B.
	9.2		18.3	21.4	60.3	0.83	92.8	5.2	D.B.
1.50-1.60	3.9	0.8	26.5				96.7	6.1	A.D.B.
	3.9		26.7				96.7	6.1	D.B.
+1.60	3.3	0.8	61.9				100.0	7.9	A.D.B.
	3.3		62.4				100.0	8.0	D.B.

COMPOSITE 1/4" x 65M FLOATS @ 1.50 S.G., A.D.B.						
F.S.I.	P% ON COAL	DILATATION TEST				
		SOFTENING TEMP. (°C)	MAX. DIL. TEMP. (°C)	MAXIMUM CONTR. %	MAXIMUM DIL. %	G. NO.
7 1/2	.13	371	440	20	203	1.075

Birtley Engineering

Subsidiary of Great West Steel Industries

Lab. No. 8205 Date Jan 28, 1977

Client: ELCO MINING LTD.

Sample Identification: DH-26-4

Starting Temperature °C: 350

Softening Temperature °C: 371

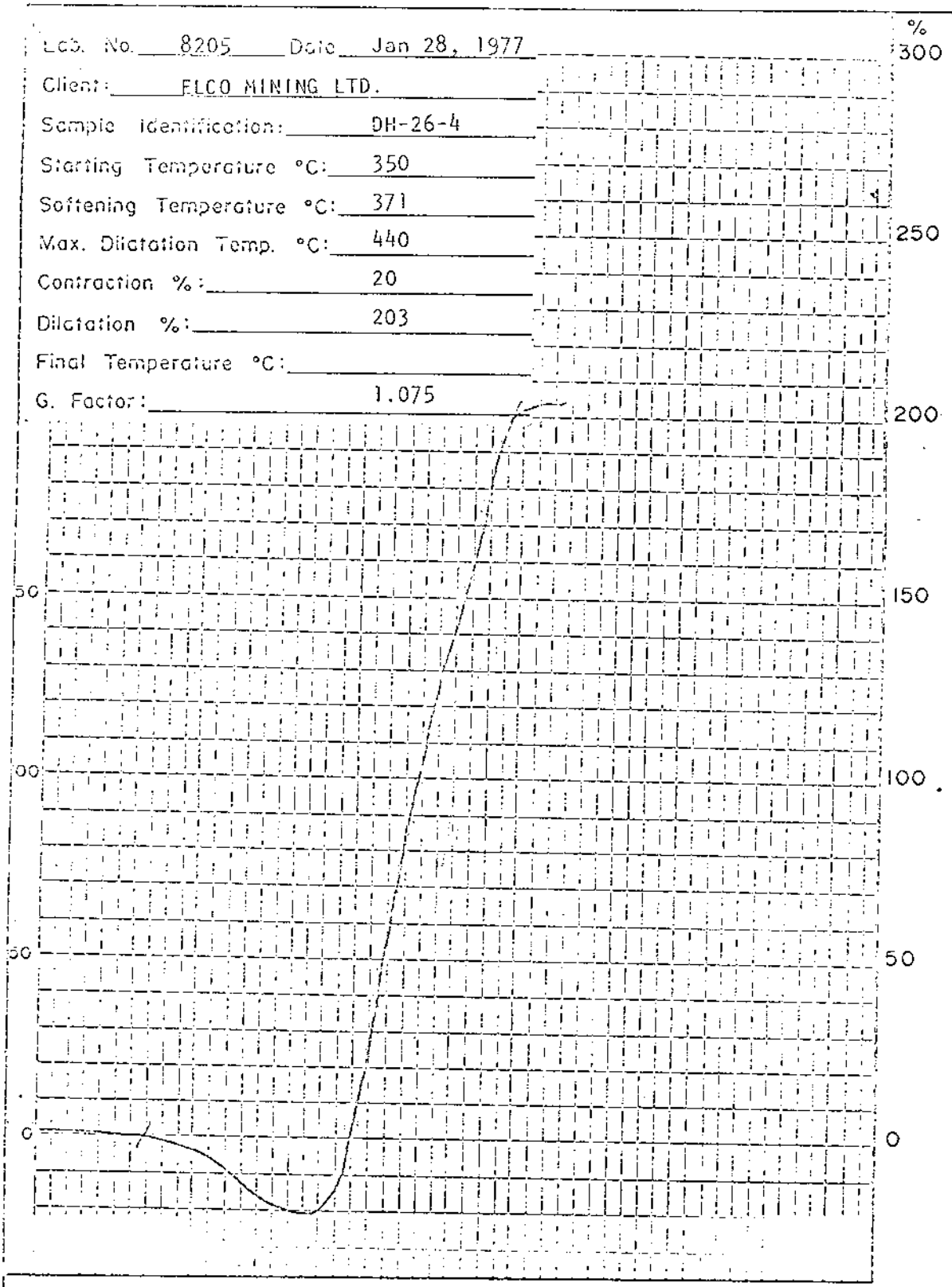
Max. Dilatation Temp. °C: 440

Contraction %: 20

Dilatation %: 203

Final Temperature °C:

G. Factor: 1.075



DIRTLEY ENGINEERING (CANADA) LTD.

Title

RUHR DILATOMETER TEST

Date

Drawn

ELCO MINING LTD.

CORE SAMPLE ANALYSIS

HOLE NO.: DH-26-5 Lab. No. 8206 DATE: Jan/77

HEAD RAW ANALYSIS						
R.M. %	ASH %	V.M. %	F.C. %	S. %	H.G.I.	REMARKS
0.8	16.6	24.3	58.3	0.80	94	Air Dried Basis
	16.7	24.5	58.8	0.81	--	Dry Basis

SIZE/RAW ANALYSES								
SIZE FRACTION	WT. %	R.M. %	ASH %	S. %	CUMULATIVE WT. %	CUMULATIVE ASH %	CUMULATIVE S. %	
1/4" x 65M	85.5	0.6	17.0	0.81	85.5	17.0	0.81	A.D.B.
	85.5		17.1	0.81	85.5	17.1	0.81	D.B.
65M x 0	14.5	0.8	18.2	0.75	100.0	17.2	0.80	A.D.B.
	14.5		18.3	0.76	100.0	17.3	0.80	D.B.

SINK-FLOAT ANALYSIS: 1/4" x 65M									
S. G.	WT. %	R.M. %	ASH %	V.M. %	F.C. %	S. %	CUMULATIVE WT. %	CUMULATIVE ASH %	
-1.40	76.4	1.3	4.3	25.5	68.9	0.85	76.4	4.3	A.D.B.
	76.3		4.4	25.8	69.8	0.86	76.3	4.4	D.B.
1.40-1.50	3.2	0.8	17.7	21.8	59.7	0.64	79.6	4.8	A.D.B.
	3.2		17.8	22.0	60.2	0.65	79.5	4.9	D.B.
1.50-1.60	1.8	1.5	26.7				81.4	5.3	A.D.B.
	1.8		27.1				81.3	5.4	D.B.
+1.60	18.6	1.0	64.2				100.0	16.3	A.D.B.
	18.7		64.8				100.0	16.5	D.B.

COMPOSITE 1/4" x 65M FLOATS @ 1.50 S.G., A.D.B.						
F.S.I.	P% ON COAL	DILATATION TEST				
		SOFTENING TEMP. (°C)	MAX. DIL. TEMP. (°C)	MAXIMUM CONTR. %	MAXIMUM DIL. %	G. NO.
8	.06	374	436	18	98	1.056

Birtley Engineering

Subsidiary of Great West Steel Industries

Lab. No. 8266 Date Jan 28, 1977

Client: ELCO MINING LTD.

Sample Identification: DH-26-5

Starting Temperature °C: 350

Softening Temperature °C: 374

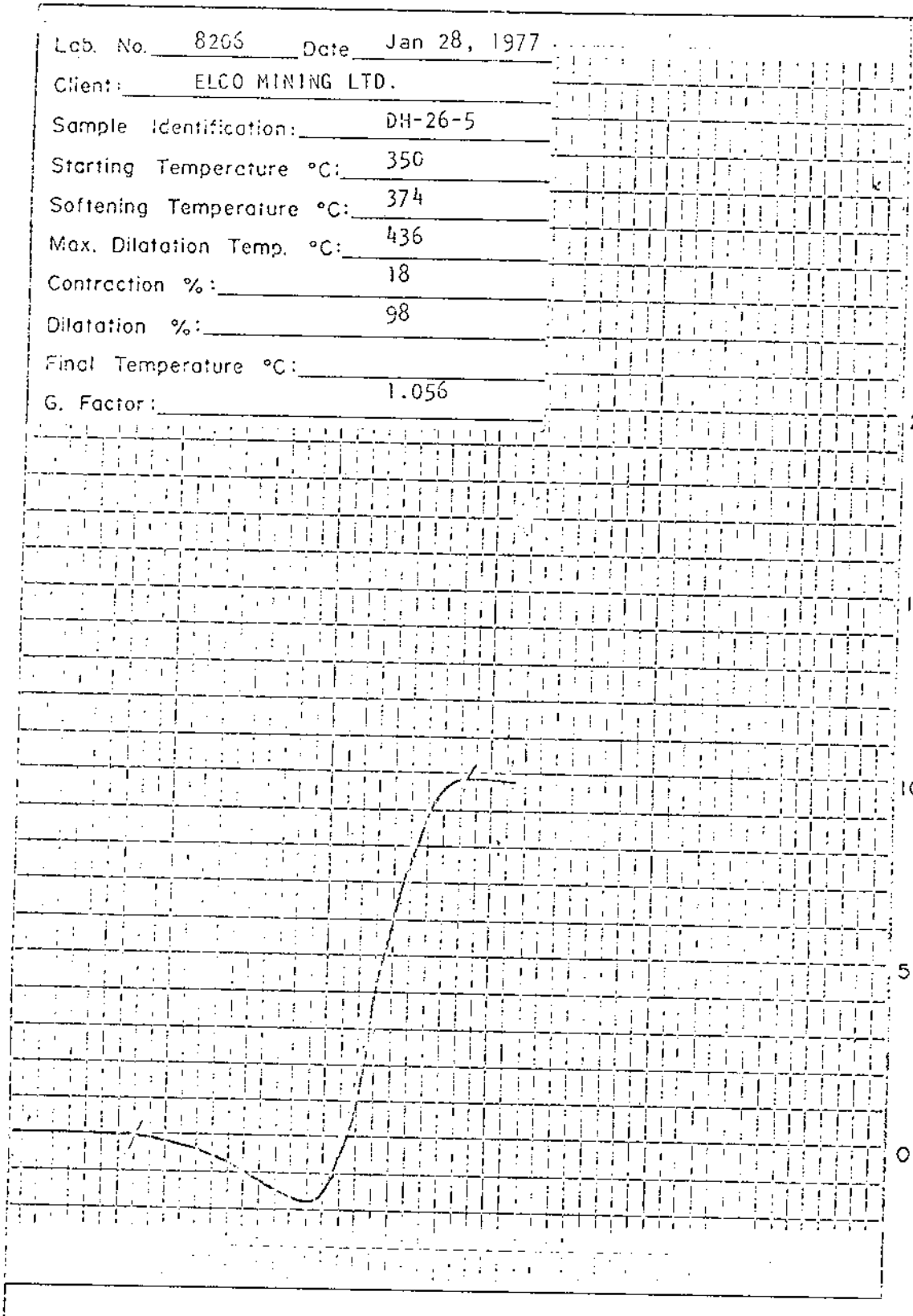
Max. Dilatation Temp. °C: 436

Contraction %: 18

Dilatation %: 98

Final Temperature °C:

G. Factor: 1.056



BARTLEY ENGINEERING (CANADA) LTD.

Title

RUHR DILATOMETER TEST

Date

Drawn

ELCO MINING LTD.

CORE SAMPLE ANALYSIS

HOLE NO.: DH-27-1 Lab. NO. 8207 DATE: Jan/77

HEAD RAW ANALYSIS						
R.M. %	ASH %	V.M. %	F.C. %	S. %	H.G.I.	REMARKS:
0.8	19.6	26.8	52.8	1.18	109	Air Dried Basis
	19.8	27.0	53.2	1.19	---	Dry Basis

SIZE / RAW ANALYSES								
SIZE FRACTION	WT. %	R.M. %	ASH %	S. %	CUMULATIVE WT. %	CUMULATIVE ASH %	CUMULATIVE S. %	
1/4" x 65M	85.3	1.4	16.7	1.20	85.3	16.7	1.20	A.D.B.
	85.3		16.9	1.22	85.3	16.9	1.22	D.B.
65M x 0	14.7	0.8	32.6	1.36	100.0	19.0	1.22	A.D.B.
	14.7		32.9	1.37	100.0	19.3	1.24	D.B.

SINK - FLOAT ANALYSIS: 1/4" x 65M									
S. G.	WT. %	R.M. %	ASH %	V.M. %	F.C. %	S. %	CUMULATIVE WT. %	CUMULATIVE ASH %	
-1.40	78.9	1.9	3.6	31.3	63.2	1.20	78.9	3.6	A.D.B.
	78.8		3.7	31.9	64.4	1.22	78.8	3.7	D.B.
1.40-1.50	1.5	1.0	19.1	27.4	52.5	1.33	80.4	3.9	A.D.B.
	1.5		19.3	27.7	53.0	1.34	80.3	4.0	D.B.
1.50-1.60	1.7	0.9	33.5				82.1	4.5	A.D.B.
	1.7		33.8				82.0	4.6	D.B.
+1.60	17.9	1.5	70.1				100.0	16.2	A.D.B.
	18.0		71.2				100.0	16.6	D.B.

COMPOSITE 1/4" x 65M FLOATS @ 1.50 S.G., A.D.B.						
F.S.I.	P% ON COAL	DILATATION TEST				
		SOFTENING TEMP. (°C)	MAX. DIL. TEMP. (°C)	MAXIMUM CONTR. %	MAXIMUM DIL. %	G. NO.
8	.02	374	429	9	195	1.067

Birtley Engineering

Subsidiary of Great West Steel Industries

Lab. No. 8207 Date Jan 28, 1977

Client: ELCO MINING LTD.

Sample Identification: DH-27-1

Starting Temperature °C: 350

Softening Temperature °C: 374

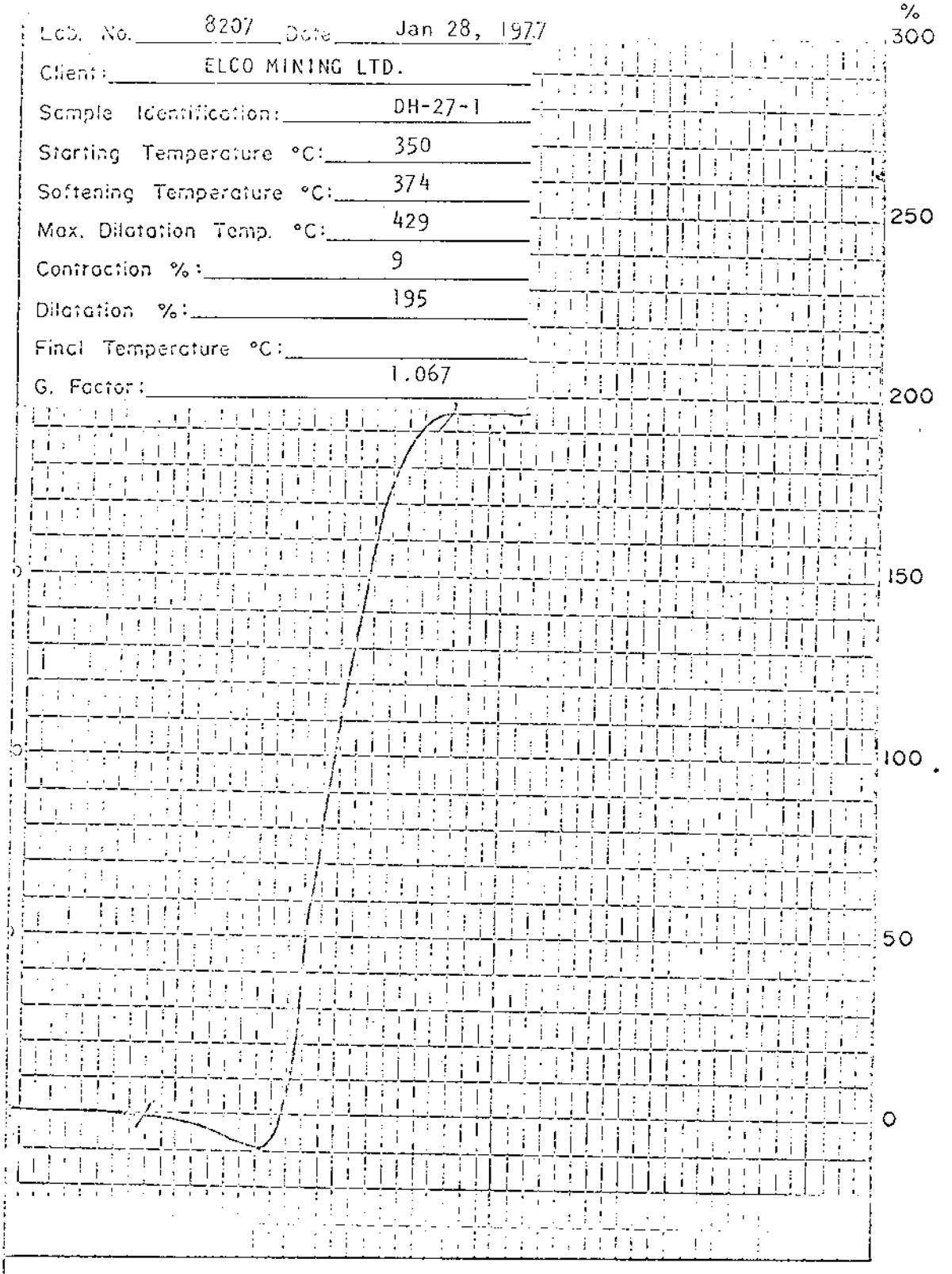
Max. Dilatation Temp. °C: 429

Contraction %: 9

Dilatation %: 195

Final Temperature °C:

G. Factor: 1.067



BARTLEY ENGINEERING (CANADA) LTD.

Title

RUHR DILATOMETER TEST

Date

Drawn

ELCO MINING LTD.

CORE SAMPLE ANALYSIS

HOLE NO.: DH-27-2 Lab. No. 8208 DATE: Jan/77

HEAD RAW ANALYSIS						
R.M. %	ASH %	V.M. %	F.C. %	S. %	H.G.I.	REMARKS
0.9	4.7	31.7	62.7	0.98	75	Air Dried Basis
	4.7	32.0	63.3	0.99	--	Dry Basis

SIZE/RAW ANALYSES								
SIZE FRACTION	WT. %	R.M. %	ASH %	S. %	CUMULATIVE WT. %	CUMULATIVE ASH %	CUMULATIVE S. %	
1/4" x 65M	96.7	0.9	4.8	0.99	96.7	4.8	0.99	A.D.B.
	96.8		4.8	1.00	96.8	4.8	1.00	D.B.
65M x 0	3.3	1.2	8.1	0.92	100.0	4.9	0.99	A.D.B.
	3.2		8.2	0.93	100.0	4.9	1.00	D.B.

SINK-FLOAT ANALYSIS: 1/4" x 65M									
S. G.	WT. %	R.M. %	ASH %	V.M. %	F.C. %	S. %	CUMULATIVE WT. %	CUMULATIVE ASH %	
-1.40	95.9	0.6	2.7	32.5	64.2	0.94	95.9	2.7	A.D.B.
	95.9		2.7	32.7	64.6	0.95	95.9	2.7	D.B.
1.40-1.50	0.7	0.8	22.0	24.9	52.3	0.84	96.6	2.8	A.D.B.
	0.7		22.2	25.1	52.7	0.85	96.6	2.8	D.B.
1.50-1.60	0.6	0.8	33.5				97.2	3.0	A.D.B.
	0.6		33.8				97.2	3.0	D.B.
+1.60	2.8	0.9	64.3				100.0	4.7	A.D.B.
	2.8		64.9				100.0	4.8	D.B.

COMPOSITE 1/4" x 65M FLOATS @ 1.50 S.G., A.D.B.						
F.S.I.	P% ON COAL	DILATATION TEST				
		SOFTENING TEMP. (°C)	MAX. DIL. TEMP. (°C)	MAXIMUM CONTR. %	MAXIMUM DIL. %	G. NO.
6 1/2	.02	359	434	22	260	1.087

Birtley Engineering

Subsidiary of Great West Steel Industries

Lab. No. 8208 Date Jan 28, 1977.

Client: ELCO MINING LTD.

Sample Identification: DH-27-2

Starting Temperature °C: 350

Softening Temperature °C: 359

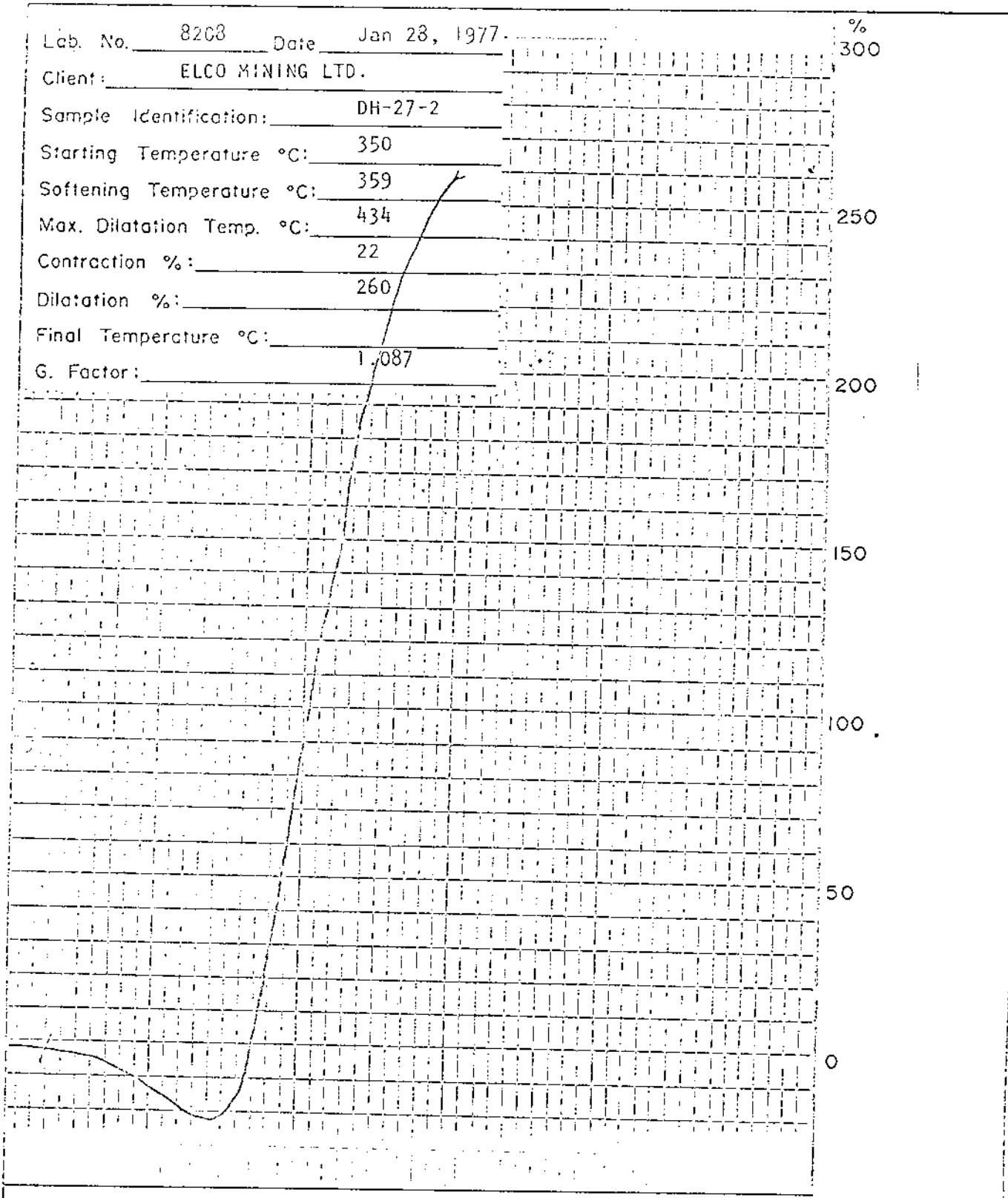
Max. Dilatation Temp. °C: 434

Contraction %: 22

Dilatation %: 260

Final Temperature °C:

G. Factor: 1.087



BARTLEY ENGINEERING (CANADA) LTD.

Title

RUHR DILATOMETER TEST

Date

Drawn

ELCO MINING LTD.

CORE SAMPLE ANALYSIS

HOLE NO.: DH-27-3 Lab. No. 8209 DATE: Jan/77

HEAD RAW ANALYSIS						
R.M. %	ASH %	V.M. %	F.C. %	S. %	H.G.I.	REMARKS
1.5	17.6	28.7	52.2	1.26	83	Air Dried Basis
	17.9	29.1	53.0	1.28	--	Dry Basis

SIZE / RAW ANALYSES								
SIZE FRACTION	WT. %	R.M. %	ASH %	S. %	CUMULATIVE WT. %	CUMULATIVE ASH %	CUMULATIVE S. %	
1/4" x 65M	91.4	1.0	18.8	1.22	91.4	18.8	1.22	A.D.B.
	91.5		19.0	1.23	91.5	19.0	1.23	D.B.
65M x 0	8.6	2.7	14.7	1.29	100.0	18.4	1.23	A.D.B.
	8.5		15.1	1.33	100.0	18.7	1.24	D.B.

SINK - FLOAT ANALYSIS: 1/4" x 65M									
S. G.	WT. %	R.M. %	ASH %	V.M. %	F.C. %	S. %	CUMULATIVE WT. %	CUMULATIVE ASH %	
-1.40	74.7	0.9	7.3	23.2	59.6	1.24	74.7	7.3	A.D.B.
	74.7		7.4	32.5	60.1	1.25	74.7	7.4	D.B.
1.40-1.50	9.2	1.0	21.0	28.5	49.5	1.31	83.9	8.8	A.D.B.
	9.2		21.2	28.8	50.0	1.32	83.9	8.9	D.B.
1.50-1.60	1.8	1.0	27.1				85.7	9.2	A.D.B.
	1.8		27.4				85.7	9.3	D.B.
+1.60	14.3	0.8	75.1				100.0	18.6	A.D.B.
	14.3		75.7				100.0	18.8	D.B.

COMPOSITE 1/4" x 65M FLOATS @ 1.50 S.G., A.D.B.						
F.S.I.	P% ON COAL	DILATATION TEST				
		SOFTENING TEMP. (°C)	MAX. DIL. TEMP. (°C)	MAXIMUM CONTR. %	MAXIMUM DIL. %	G. NO.
8	.15	359	433	23	267	1.085

Birtley Engineering

Subsidiary of Great West Steel Industries

Lab. No. 8209 Date Jan 28, 1977

Client: ELCO MINING LTD.

Sample Identification: DH-27-3

Starting Temperature °C: 350

Softening Temperature °C: 359

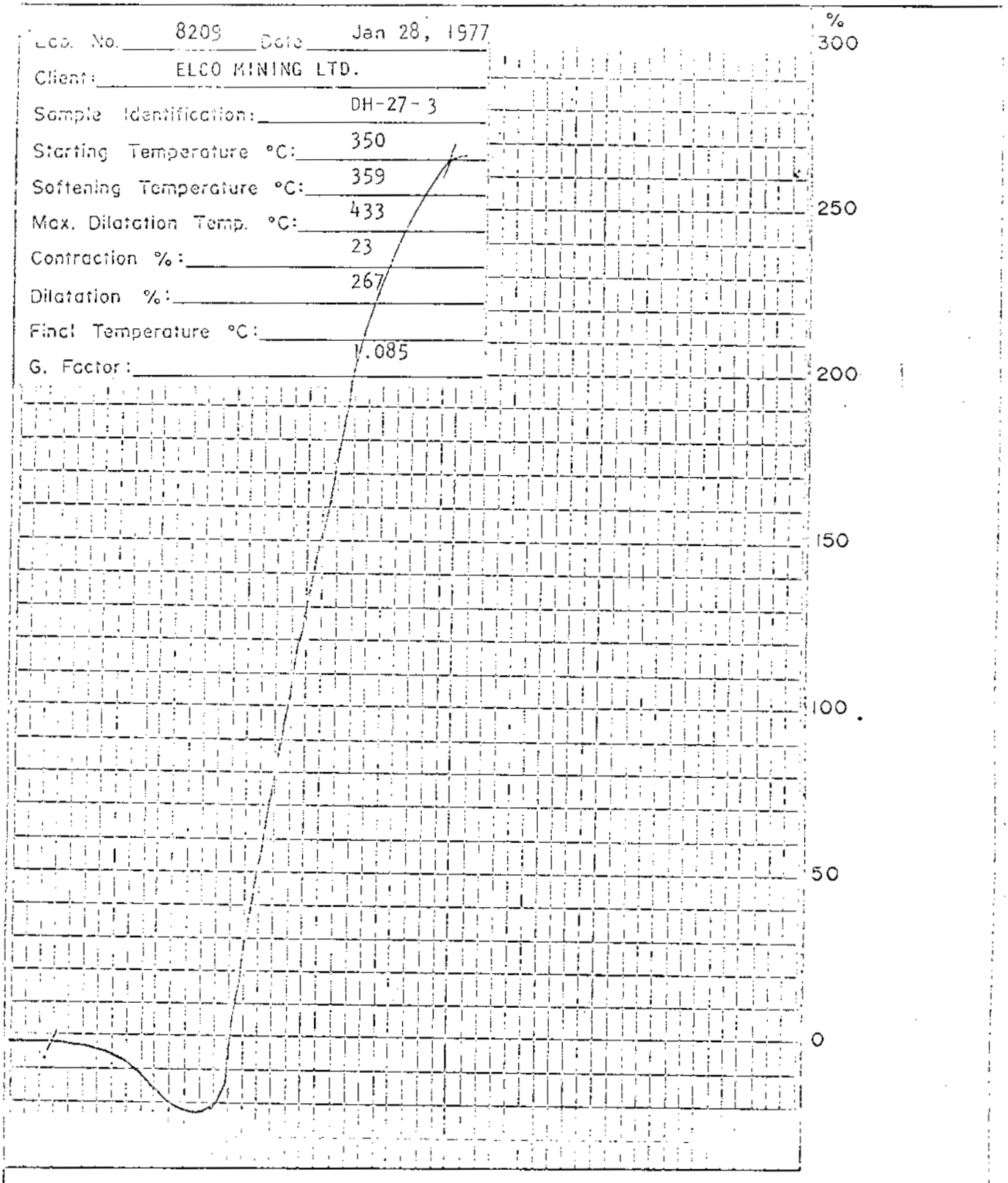
Max. Dilatation Temp. °C: 433

Contraction %: 23

Dilatation %: 267

Final Temperature °C:

G. Factor: 1.085



BARTLEY ENGINEERING (CANADA) LTD.

Title

RUHR DILATOMETER TEST

Date

Drawn

ELCO MINING LTD.

CORE SAMPLE ANALYSIS

HOLE NO.: DH-27-4 Lab. No. 8210 DATE: Jan/77

HEAD RAW ANALYSIS						
R.M. %	ASH %	V.M. %	F.C. %	S. %	H.G.I.	REMARKS
1.0	6.1	29.4	63.5	0.91	77	Air Dried Basis
	6.2	29.7	64.1	0.92	--	Dry Basis

SIZE / RAW ANALYSES								
SIZE FRACTION	WT. %	R.M. %	ASH %	S. %	CUMULATIVE WT. %	CUMULATIVE ASH %	CUMULATIVE S. %	
1/4" x 65M	95.0	0.9	6.8	0.94	95.0	6.8	0.94	A.D.B.
	95.0		6.9	0.95	95.0	6.9	0.95	D.B.
65M x 0	5.0	1.8	5.7	0.90	100.0	6.7	0.94	A.D.B.
	5.0		5.8	0.92	100.0	6.8	0.95	D.B.

SINK-FLOAT ANALYSIS: 1/4" x 65M									
S. G.	WT. %	R.M. %	ASH %	V.M. %	F.C. %	S. %	CUMULATIVE WT. %	CUMULATIVE ASH %	
-1.40	92.1	0.8	2.1	30.6	66.5	0.88	92.1	2.1	A.D.B.
	92.1		2.1	30.8	67.1	0.89	92.1	2.1	D.B.
1.40-1.50	0.7	0.9	10.2	24.7	64.2	0.84	92.8	2.2	A.D.B.
	0.7		10.3	24.9	64.8	0.85	92.8	2.2	D.B.
1.50-1.60	0.2	1.0	21.7				93.0	2.2	A.D.B.
	0.2		21.9				93.0	2.2	D.B.
+1.60	7.0	0.8	66.9				100.0	6.7	A.D.B.
	7.0		67.4				100.0	6.8	D.B.

COMPOSITE 1/4" x 65M FLOATS @ 1.50 S.G., A.D.B.						
F.S.I.	P% ON COAL	DILATATION TEST				
		SOFTENING TEMP. (°C)	MAX. DIL. TEMP. (°C)	MAXIMUM CONTR. %	MAXIMUM DIL. %	G. NO.
8	.01	357	429	23	169	1.075

Birtley Engineering

Subsidiary of Great West Steel Industries

Lab. No. 8210 Date Jan 27, 1977

Client: ELCO MINING LTD.

Sample Identification: DH-27-4

Starting Temperature °C: 350

Softening Temperature °C: 357

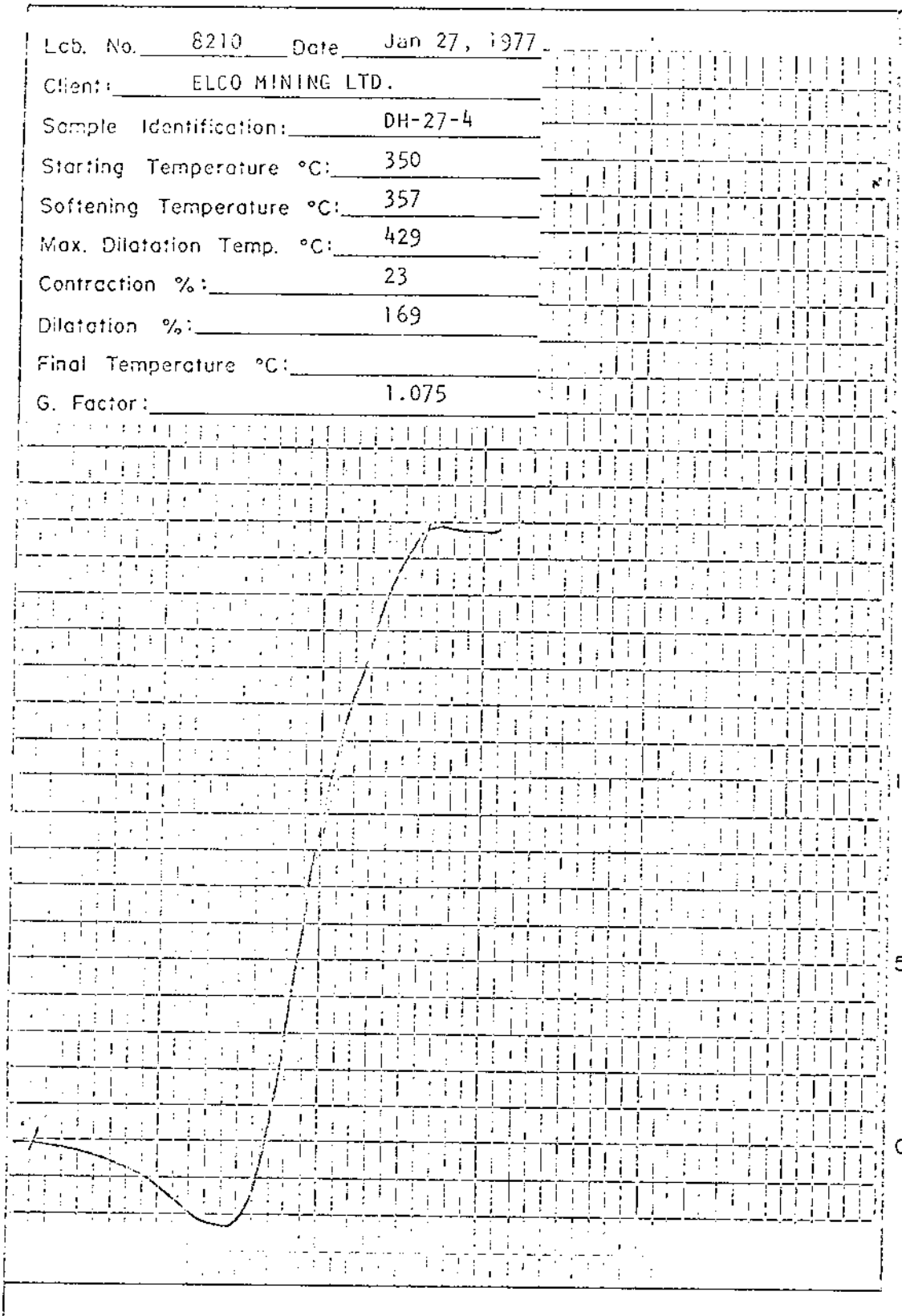
Max. Dilatation Temp. °C: 429

Contraction %: 23

Dilatation %: 169

Final Temperature °C:

G. Factor: 1.075



BARTLEY ENGINEERING (CANADA) LTD.

Title	Date
RUHR DILATOMETER TEST	
	Drawn

ELCO MINING LTD.

CORE SAMPLE ANALYSIS

HOLE NO.: DH-27-5 Lab. No. 8211 DATE: Jan/77

HEAD RAW ANALYSIS						
R.M. %	ASH %	V.M. %	F.C. %	S. %	H.G.I.	REMARKS
0.9	20.8	25.8	52.5	0.93	74	Air Dried Basis
	21.0	26.0	53.0	0.94	--	Dry Basis

SIZE / RAW ANALYSES								
SIZE FRACTION	WT. %	R.M. %	ASH %	S. %	CUMULATIVE WT. %	CUMULATIVE ASH %	CUMULATIVE S. %	
1/4" x 65M	96.0	0.8	20.7	0.92	96.0	20.7	0.92	A.D.B.
	96.1		20.9	0.93	96.1	20.9	0.93	D.B.
65M x 0	4.0	1.5	19.8	0.96	100.0	20.7	0.92	A.D.B.
	3.9		20.1	0.97	100.0	20.9	0.93	D.B.

SINK-FLOAT ANALYSIS: 1/4" x 65M									
S. G.	WT. %	R.M. %	ASH %	V.M. %	F.C. %	S. %	CUMULATIVE WT. %	CUMULATIVE ASH %	
-1.40	69.5	0.8	4.8	30.4	64.0	1.04	69.5	4.8	A.D.B.
	69.5		4.8	30.6	64.6	1.05	69.5	4.8	D.B.
1.40-1.50	6.0	0.8	22.5	25.2	51.5	0.96	75.5	6.2	A.D.B.
	6.0		22.7	25.4	51.9	0.97	75.5	6.2	D.B.
1.50-1.60	4.1	0.8	32.3				79.6	7.6	A.D.B.
	4.1		32.6				79.6	7.6	D.B.
+1.60	20.4	0.9	71.4				100.0	20.6	A.D.B.
	20.4		72.0				100.0	20.7	D.B.

COMPOSITE 1/4" x 65M FLOATS @ 1.50 S.G., A.D.B.						
F.S.I.	P% ON COAL	DILATATION TEST				
		SOFTENING TEMP.. (°C)	MAX. DIL. TEMP. (°C)	MAXIMUM CONTR. %	MAXIMUM DIL. %	G. NO.
8 1/2	.08	356	435	22	266	1.092

Birtley Engineering

Subsidiary of Great West Steel Industries

Lab. No. 8211 Date Jan 27, 1977

Client: ELCO MINING LTD.

Sample Identification: DH-27-5

Starting Temperature °C: 350

Softening Temperature °C: 356

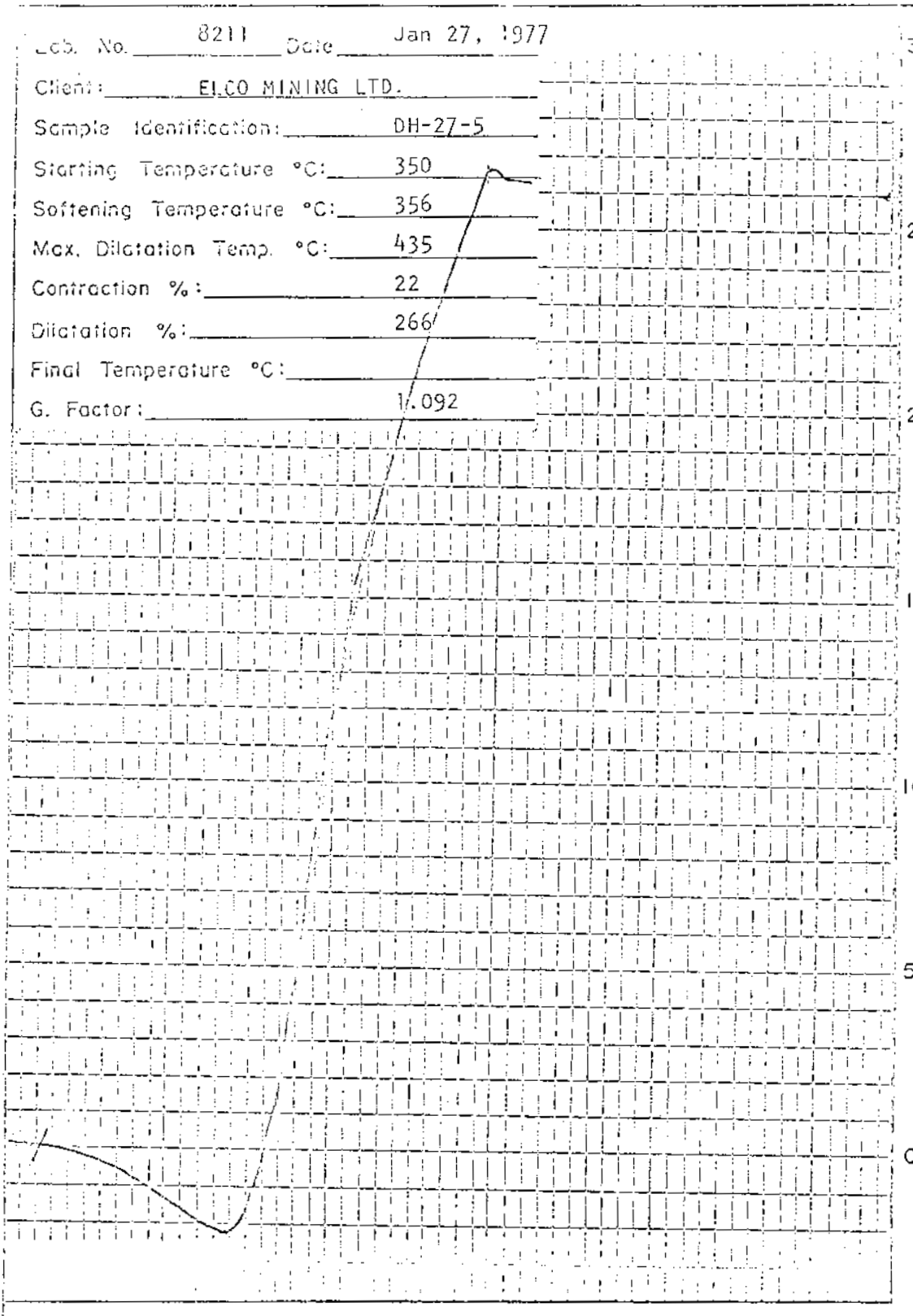
Max. Dilatation Temp. °C: 435

Contraction %: 22

Dilatation %: 266

Final Temperature °C:

G. Factor: 1.092



BARTLEY ENGINEERING (CANADA) LTD.

Title	Date
RUHR DILATOMETER TEST	
	Drawn

Warnock Hersey Professional Services Ltd.

ELCO MINING LTD. CORE SAMPLE ANALYSIS

Hole No.: DH 28 - 1 Lab. No.: 77 - 3051 Date: March 28, 1977

HEAD RAW ANALYSIS						
R.M.%	Ash%	V.M.%	F.C %	S.%	H.G.I.	REMARKS
0.5	15.5	18.0	66.0	0.62	101.0	Air Dried Basis
- - -	15.5	18.1	66.4	0.62	- - -	Dry Basis

SIZE / RAW ANALYSES								
Size Fraction	Wt. %	R.M.%	Ash %	S. %	CUMULATIVE			
					Wt. %	Ash %	S. %	
¼ x 65	89.6	0.4	15.7	0.64	89.6	15.7	0.64	A.D.B.
	89.6	- -	15.7	0.64	89.6	15.7	0.64	D.B.
65 x 0	10.4	0.7	12.3	0.70	100.0	15.3	0.65	A.D.B.
	10.4	- -	12.4	0.70	100.0	15.4	0.65	D.B.

SINK - FLOAT ANALYSIS: ¼" x 65 M									
S. G.	Wt.%	R.M%	Ash %	V.M%	F.C%	S.%	Cumulative		
							Wt. %	Ash %	
-1.40	64.9	0.8	5.9	20.7	72.6	0.62	64.9	5.9	A.D.B.
	64.9	- -	5.9	20.8	73.3	0.62	64.9	5.9	D.B.
1.40-1.50	13.2	0.6	15.6	18.5	65.3	0.54	78.1	7.5	A.D.B.
	13.2	- -	15.7	18.6	65.7	0.54	78.1	7.6	D.B.
1.50-1.60	11.6	0.6	23.8	- - -	- - -	- - -	89.7	9.6	A.D.B.
	11.6	- -	23.9	- -	- -	- - -	89.7	9.7	D.B.
+1.60	10.3	0.6	60.9	- -	- -	- - -	100.0	14.9	A.D.B.
	10.3	- -	61.3	- - -	- - -	- - -	100.0	15.0	D.B.

COMPOSITE ¼" x 65 m FLOATS @ 1.50 S.G., A.D.B.						
F.S.I.	P % on Coal	DILATATION TESTS				
		Softening Temp. (°C)	Max. Dil. Temp. (°C)	Maximum Contr. %	Maximum Dil. %	G.No.
3½	0.008					

Warnock Hersey Professional Services Ltd.

ELCO MINING LTD. CORE SAMPLE ANALYSIS

Hole No.: DH 28 – 2 Lab. No.: 77 - 3052 Date: March 25, 1977

HEAD RAW ANALYSIS						
F.M.%	Ash%	V.M.%	F.C.%	S.%	H.G.I.	REMARKS
0.5	11.6	17.2	70.7	0.78	82.3	Air Dried Basis
- - -	11.6	17.3	71.1	0.79	- - -	Dry Basis

SIZE / RAW ANALYSES								
Size Fraction	Wt. %	R.M.%	Ash %	S. %	CUMULATIVE			
					Wt. %	Ash %	S. %	
¼ x 65	90.3	0.4	11.6	0.80	90.3	11.6	0.80	A.D.B.
	90.3	- - -	11.7	0.80	90.3	11.7	0.80	D.B.
65 x 0	9.7	0.6	10.8	0.80	100.0	11.5	0.80	A.D.B.
	9.7	- - -	10.9	0.80	100.0	11.6	0.80	D.B.

SINK - FLOAT ANALYSIS: ¼" x 65 M									
S. G.	Wt.%	R.M%	Ash %	V.M%	F.C%	S.%	Cumulative		
							Wt. %	Ash %	
-1.40	72.2	0.5	6.8	18.6	74.1	0.74	72.2	6.8	A.D.B.
	72.2	- - -	6.9	18.6	74.5	0.74	72.2	6.9	D.B.
1.40-1.50	12.3	0.4	15.5	17.7	66.4	0.66	84.5	8.1	A.D.B.
	12.3	- -	15.6	17.8	66.6	0.66	84.5	8.2	D.B.
1.50-1.60	9.4	0.4	22.2	- - -	- - -	- -	93.9	9.5	A.D.B.
	9.4	- -	22.3	- - -	- -	- - -	93.9	9.6	D.B.
+1.60	6.1	0.5	42.1	- - -	- -	- -	100.0	11.5	A.D.B.
	6.1	- -	42.3	- -	- - -	- -	100.0	11.6	D.B.

COMPOSITE ¼" x 65 m FLOATS @ 1.50 S.G., A.D.B.						
F.S.I.	P % on Coal	DILATATION TESTS				
		Softening Temp. (°C)	Max. Dil. Temp. (°C)	Maximum Contr. %	Maximum Dil. %	G.No.
4	0.015					

Warnock Hersey Professional Services Ltd.

ELCO MINING LTD. CORE SAMPLE ANALYSIS

Hole No.: DH 28 - 3 Lab. No.: 77 - 3053 Date: March 25, 1977

HEAD RAW ANALYSIS						
R.M.%	Ash%	V.M.%	F.C.%	S.%	H.G.I.	REMARKS
0.5	25.9	17.0	56.6	0.72	99.6	Air Dried Basis
- - -	25.0	17.1	56.9	0.72	- - -	Dry Basis

SIZE / RAW ANALYSES								
Size Fraction	Wt. %	R.M.%	Ash %	S. %	CUMULATIVE			
					Wt. %	Ash %	S. %	
¼ x 65	89.0	0.4	28.0	0.72	89.0	28.0	0.72	A.D.B.
	89.0	- - -	28.2	0.72	89.0	28.2	0.72	D.B.
65 x 0	11.0	0.5	15.6	0.92	100.0	26.6	0.74	A.D.B.
	11.0	- - -	15.7	0.92	100.0	26.8	0.74	D.B.

SINK - FLOAT ANALYSIS: ¼" x 65 M									
S. G.	Wt.%	R.M%	Ash %	V.M%	F.C%	S.%	Cumulative		
							Wt. %	Ash %	
-1.40	44.6	0.4	7.2	20.2	72.2	0.82	44.6	7.2	A.D.B.
	44.6	- -	7.2	20.2	72.6	0.82	44.6	7.2	D.B.
1.40-1.50	15.2	0.5	17.7	18.5	63.3	0.73	59.8	9.9	A.D.B.
	15.2	- -	17.8	18.6	63.6	0.73	59.8	9.9	D.B.
1.50-1.60	8.1	0.6	25.6	- - -	- - -	- --	67.9	11.7	A.D.B.
	8.1	- -	25.8	- - -	- - -	- --	67.9	11.8	D.B.
+1.60	32.1	0.6	62.5	- --	- --	- --	100.0	28.0	A.D.B.
	32.1	- - -	62.9	- --	- --	- --	100.0	28.2	D.B.

COMPOSITE ¼" x 65 m FLOATS @ 1.50 S.G., A.D.B.						
F.S.I.	F % on Coal	DILATATION TESTS				
		Softening Temp. (°C)	Max. Dil. Temp. (°C)	Maximum Contr. %	Maximum Dil. %	G. No.
8½	0.060					

Warnock Hersey Professional Services Ltd.

ELCO MINING LTD. CORE SAMPLE ANALYSIS

Hole No.: DH 28 - 4 Lab. No.: 77 - 3054 Date: March 28, 1977

HEAD RAW ANALYSIS						
R.M.%	Ash%	V.M.%	F.C %	S.%	H.G.I.	REMARKS
0.9	31.0	15.0	53.1	0.35	92.7	Air Dried Basis
- - -	31.3	15.2	53.5	0.35	- - -	Dry Basis

SIZE / RAW ANALYSES								
Size Fraction	Wt. %	R.M.%	Ash %	S. %	CUMULATIVE			
					Wt. %	Ash %	S. %	
¼ x 65	87.1	0.8	32.3	0.38	87.1	32.3	0.38	A.D.B.
	87.1	- -	32.5	0.38	87.1	32.5	0.38	D.B.
65 x 0	12.9	0.8	20.9	0.42	100.0	30.8	0.38	A.D.B.
	12.9	- -	21.1	0.42	100.0	31.0	0.38	D.B.

SINK - FLOAT ANALYSIS: ¼" x 65 M									
S. G.	Wt.%	R.M%	Ash %	V.M%	F.C%	S.%	Cumulative		
							Wt. %	Ash %	
-1.40	51.7	0.9	7.4	19.7	72.0	0.36	51.7	7.4	A.D.B.
	51.7	- -	7.5	19.9	72.6	0.36	51.7	7.5	D.B.
1.40-1.50	9.7	1.3	14.6	17.1	67.0	0.32	61.4	8.5	A.D.B.
	9.7	- -	14.8	17.3	67.9	0.32	61.4	8.6	D.B.
1.50-1.60	3.7	0.9	21.3	- -	- - -	- - -	65.1	9.3	A.D.B.
	3.7	- - -	21.5	- - -	- - -	- - -	65.1	9.4	D.B.
+1.60	34.9	0. 7	73.6	- -	- - -	- - -	100.0	31.7	A.D.B.
	34.9	- -	74.1	- - -	- - -	- - -	100.0	32.0	D.B.

COMPOSITE ¼" x 65 m FLOATS @ 1.50 S.G., A.D.B.							
F.S.I.	F % on Coal	DILATATION TESTS					
		Softening Temp. (°C)	Max. Dil. Temp. (°C)	Maximum Contr. %	Maximum Dil. %	G.No.	
4	0.073						

Warnock Hersey Professional Services Ltd.

ELCO MINING LTD. CORE SAMPLE ANALYSIS

Hole No.: DH 28 - 5 Lab. No.: 77 - 3055 Date: March 25, 1977

HEAD RAW ANALYSIS						
F.M.%	Ash%	V.M.%	F.C.%	S.%	H.G.I.	REMARKS
0.4	14.0	17.8	67.8	0.55	146.1	Air Dried Basis
- - -	14.1	17.8	68.1	0.55	- - -	Dry Basis

SIZE / RAW ANALYSES								
Size Fraction	Wt. %	R.M.%	Ash %	S. %	CUMULATIVE Wt. %	CUMULATIVE Ash %	CUMULATIVE S. %	
¼ x 65	85.5	0.5	13.2	0.57	85.5	13.2	0.57	A.D.B.
	85.5	- - -	13.2	0.57	85.5	13.2	0.57	D.B.
65 x 0	14.5	0.6	12.8	0.54	100.0	13.1	0.56	A.D.B.
	14.5	- - -	12.8	0.54	100.0	13.1	0.56	D.B.

SINK - FLOAT ANALYSIS: ¼" x 65 M									
S. G.	Wt.%	R.M%	Ash %	V.M%	F.C%	S.%	Cumulative Wt. %	Cumulative Ash %	
-1.40	78.4	1.1	4.8	21.6	72.5	0.52	78.4	4.8	A.D.B.
	78.3	- -	4.9	21.8	73.3	0.53	78.3	4.9	D.B.
1.40-1.50	6.1	1.2	12.9	18.8	67.1	0.45	84.5	5.4	A.D.B.
	6.1	- - -	13.1	19.1	67.8	0.46	84.4	5.5	D.B.
1.50-1.60	2.2	1.1	21.3	- - -	- - -	- - -	86.7	5.8	A.D.B.
	2.2	- - -	21.6	- - -	- - -	- - -	86.6	5.9	D.B.
+1.60	13.3	1.2	60.3	- - -	- - -	- - -	100.0	13.0	A.D.B.
	13.4	- - -	61.9	- - -	- - -	- - -	100.0	13.3	D.B.

COMPOSITE ¼" x 65 m FLOATS @ 1.50 S.G., A.D.B.						
F.S.I.	P % on Coal	DILATATION TESTS Softening Temp. (°C)	Max. Dil. Temp. (°C)	Maximum Contr. %	Maximum Dil. %	G.No.
6½	0.015					

Warnock Hersey Professional Services Ltd.

ELCO MINING LTD. CORE SAMPLE ANALYSIS

Hole No.: DH 28 - 6 Lab. No.: 77 - 3056 Date: March 28, 1977

HEAD RAW ANALYSIS						
R.M.%	Ash%	V.M.%	F.C %	S.%	H.G.I.	REMARKS
0.6	34.2	14.4	50.8	0.38	95.5	Air Dried Basis
- - -	34.4	14.4	51.2	0.38	- - -	Dry Basis

SIZE / RAW ANALYSES								
Size Fraction	Wt. %	R.M.%	Ash %	S. %	CUMULATIVE Wt. %	CUMULATIVE Ash %	CUMULATIVE S. %	
¼ x 65	86.7	0.5	35.2	0.37	86.7	35.2	0.37	A.D.B.
	86.7	- -	35.3	0.37	86.7	35.3	0.37	D.B.
65 x 0	13.3	0.5	22.8	0.51	100.0	33.6	0.39	A.D.B.
	13.3	- -	22.9	0.51	100.0	33.6	0.39	D.B.

SINK - FLOAT ANALYSIS: ¼" x 65 M									
S. G.	Wt.%	R.M%	Ash %	V.M%	F.C%	S.%	Cumulative Wt. %	Cumulative Ash %	
-1.40	39.3	0.8	7.3	19.0	72.9	0.51	39.3	7.3	A.D.B.
	39.3	- -	7.4	19.1	73.5	0.51	39.3	7.4	D.B.
1.40-1.50	14.4	0.7	15.4	17.5	66.4	0.42	53.7	9.5	A.D.B.
	14.4	- -	15.5	17.6	66.9	0.42	52.7	9.6	D.B.
1.50-1.60	6.4	0.8	22.6	- -	- -	- -	60.1	10.9	A.D.B.
	6.4	- -	22.8	- -	- -	- -	60.1	11.0	D.B.
+1.60	39.9	0.8	73.8	- -	- -	- -	100.0	36.0	A.D.B.
	39.9	- -	74.4	- -	- -	- -	100.0	36.3	D.B.

COMPOSITE ¼" x 65 m FLOATS @ 1.50 S.G., A.D.B.						
F.S.I.	P % on Coal	DILATATION TESTS Softening Temp. (°C)	Max. Dil. Temp. (°C)	Maximum Contr. %	Maximum Dil. %	G.No.
4½	0.007					

CLIENT: WARNOCK HERSEY

PROJECT: DILATATION TESTS *

SAMPLE : -8 Mesh, 1.50 S.G. Floats
Composite

DATE: March 30, 1977

Well No.	W.H. I.D. No.	INITIAL TEMP (°C)	SOFTENING TEMP (°C)	MAX. DILAT'N TEMP (°C)	MAX. CONTRACT'N %	MAX. DILATATION %	G.No.
DH 17-1	77-3036	320	417	---	20% @ 468°	---	---
DH 17-2	77-3037	320	406	482	30	3	0.935
DH 17-3	77-3038	320	396	475	22	56	1.041
DH 17-4	77-3039	320	396	468	26	59	1.033
DH 17-5	77-3040	320	385	478	27	145	1.080
DH 17-6	77-3041	320	385	475	22	120	1.078
DH 22-1	77-3042	320	403	---	17% @ 453°	---	---
DH 22-2	77-3043	320	429	---	22% @ 460°	---	---
DH 22-3	77-3044	320	410	---	18% @ 464°	---	---
DH 22-4	77-3045	320	421	---	20% @ 471°	---	---
DH 22-5	77-3046	320	410	---	15% @ 464°	---	---
DH 22-6	77-3047	320	392	468	24	69	1.045
DH 22-7	77-3048	320	410	---	21% @ 457°	---	---
DH 22-8	77-3049	320	410	482	24	10	0.968
DH 22-9	77-3050	320	421	---	21% @ 468°	---	---
DH 28-1	77-3051	320	421	---	19% @ 468°	---	---
DH 28-2	77-3052	320	424	---	16% @ 468°	---	---
DH 28-3	77-3053	320	406	475	25	45	1.023
DH 28-4	77-3054	320	414	---	14% @ 464°	---	---
DH 28-5	77-3055	320	414	446	24	2	0.969
DH 28-6	77-3056	320	406	478	22	- 19	0.473
~~DH 29-8~~	~~77-3057~~	~~320~~	~~406~~	~~478~~	~~26~~	~~8~~	~~0.959~~
~~DH 29-9~~	~~77-3058~~	~~320~~	~~403~~	~~478~~	~~24~~	~~22~~	~~0.996~~

* Softening Temp., Maximum Dilatation/Contraction Temp. are corrected with factor = 6/5

ELCO MINING LTD.

CORE SAMPLE ANALYSIS

HOLE NO.: DH - 29 - 1 Lab. No. 8470 DATE: Feb./77

HEAD RAW ANALYSIS						
R.M. %	ASH %	V.M. %	F.C. %	S. %	H.G.I.	REMARKS
0.6	18.8	18.3	62.3	0.40	77	Air Dried Basis
	18.9	18.4	62.7	0.40	--	Dry Basis

SIZE/RAW ANALYSES								
SIZE FRACTION	WT. %	R.M. %	ASH %	S. %	CUMULATIVE WT. %	CUMULATIVE ASH %	CUMULATIVE S. %	
1/4" x 65M	93.7	0.3	18.6	0.42	93.7	18.6	0.42	A.D.B.
	93.7		18.7	0.42	93.7	18.7	0.42	D.B.
65M x 0	6.3	0.7	12.6	0.54	100.0	18.2	0.43	A.D.B.
	6.3		12.7	0.54	100.0	18.3	0.43	D.B.

SINK-FLOAT ANALYSIS: 1/4" x 65M									
S. G.	WT. %	R.M. %	ASH %	V.M. %	F.C. %	S. %	CUMULATIVE WT. %	CUMULATIVE ASH %	
-1.40	67.2	0.6	4.8	20.1	74.5	0.46	67.2	4.8	A.D.B.
	67.3		4.8	20.2	75.0	0.46	67.3	4.8	D.B.
1.40-1.50	9.6	0.7	18.7	17.7	62.9	0.38	76.8	6.5	A.D.B.
	9.6		18.8	17.8	63.4	0.38	76.9	6.5	D.B.
1.50-1.60	6.1	0.7	29.1				82.9	8.2	A.D.B.
	6.1		29.3				83.0	8.2	D.B.
+1.60	17.1	0.9	68.8				100.0	18.6	A.D.B.
	17.0		69.4				100.0	18.6	D.B.

COMPOSITE 1/4" x 65M FLOATS @ 1.50 S.G., A.D.B.						
F.S.I.	P% ON COAL	DILATATION TEST				
		SOFTENING TEMP. (°C)	MAX. DIL. TEMP. (°C)	MAXIMUM CONTR. %	MAXIMUM DIL. %	G. NO.
7 1/2	.04	395	455	11	16	1.013

Birtley Engineering

Subsidiary of Great West Steel Industries

Lab. No. 8470 Date Feb. 25, 1977

Client: ELCO MINING LTD.

Sample Identification: DH-29-1

Starting Temperature °C: 350

Softening Temperature °C: 395

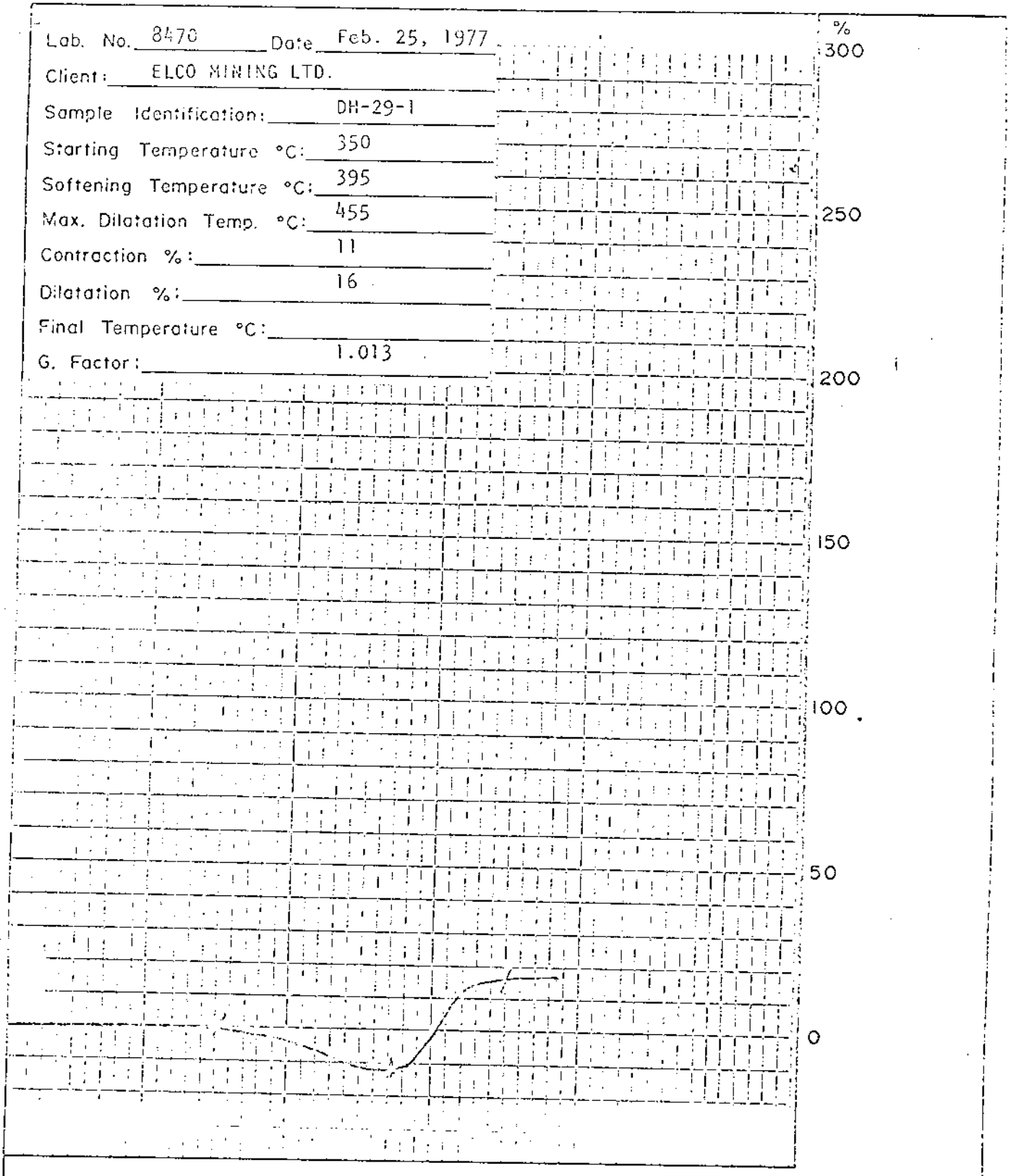
Max. Dilatation Temp. °C: 455

Contraction %: 11

Dilatation %: 16

Final Temperature °C:

G. Factor: 1.013



BIRTLEY ENGINEERING (CANADA) LTD.

Title

RUHR DILATOMETER TEST

Date

Drawn

ELCO MINING LTD.

CORE SAMPLE ANALYSIS

HOLE NO.: DH - 29 - 2 Lab. No. 8512 DATE: March/77

HEAD RAW ANALYSIS						
R.M. %	ASH %	V.M. %	F.C. %	S. %	H.G.I.	REMARKS
0.6	18.3	17.2	63.9	0.44	88	Air Dried Basis
	18.4	17.3	64.3	0.44	--	Dry Basis

SIZE / RAW ANALYSES								
SIZE FRACTION	WT. %	R.M. %	ASH %	S. %	CUMULATIVE WT. %	CUMULATIVE ASH %	CUMULATIVE S. %	
1/4" x 65M	89.7	1.4	19.0	0.44	89.7	19.0	0.44	A.D.B.
	89.7		19.3	0.45	89.7	19.3	0.45	D.B.
65M x 0	10.3	1.3	14.7	0.46	100.0	18.6	0.44	A.D.B.
	10.3		14.9	0.47	100.0	18.8	0.45	D.B.

SINK - FLOAT ANALYSIS: 1/4" x 65M									
S. G.	WT. %	R.M. %	ASH %	V.M. %	F.C. %	S. %	CUMULATIVE WT. %	CUMULATIVE ASH %	
-1.40	67.2	1.5	4.7	19.8	74.0	0.70	67.2	4.7	A.D.B.
	67.1		4.8	20.1	75.1	0.71	67.1	4.8	D.B.
1.40-1.50	9.0	0.9	15.9	17.2	66.0	0.52	76.2	6.0	A.D.B.
	9.0		16.0	17.4	66.6	0.52	76.1	6.1	D.B.
1.50-1.60	4.3	1.2	25.3				80.5	7.1	A.D.B.
	4.3		25.6				80.4	7.2	D.B.
+1.60	19.5	1.2	68.1				100.0	19.0	A.D.B.
	19.6		68.9				100.0	19.3	D.B.

COMPOSITE 1/4" x 65M FLOATS @ 1.50 S.G., A.D.B.						
F.S.I.	P% ON COAL	DILATATION TEST				
		SOFTENING TEMP. (°C)	MAX. DIL. TEMP. (°C)	MAXIMUM CONTR. %	MAXIMUM DIL. %	G. NO.
6	.07	406	---	10% @ 440°	---	---

Birtley Engineering

Subsidiary of Great West Steel Industries

Lab. No. 8512 Date Feb. 28, 1977

Client: ELCO MINING LTD.

Sample Identification: DH-29-2

Starting Temperature °C: 350

Softening Temperature °C: 406

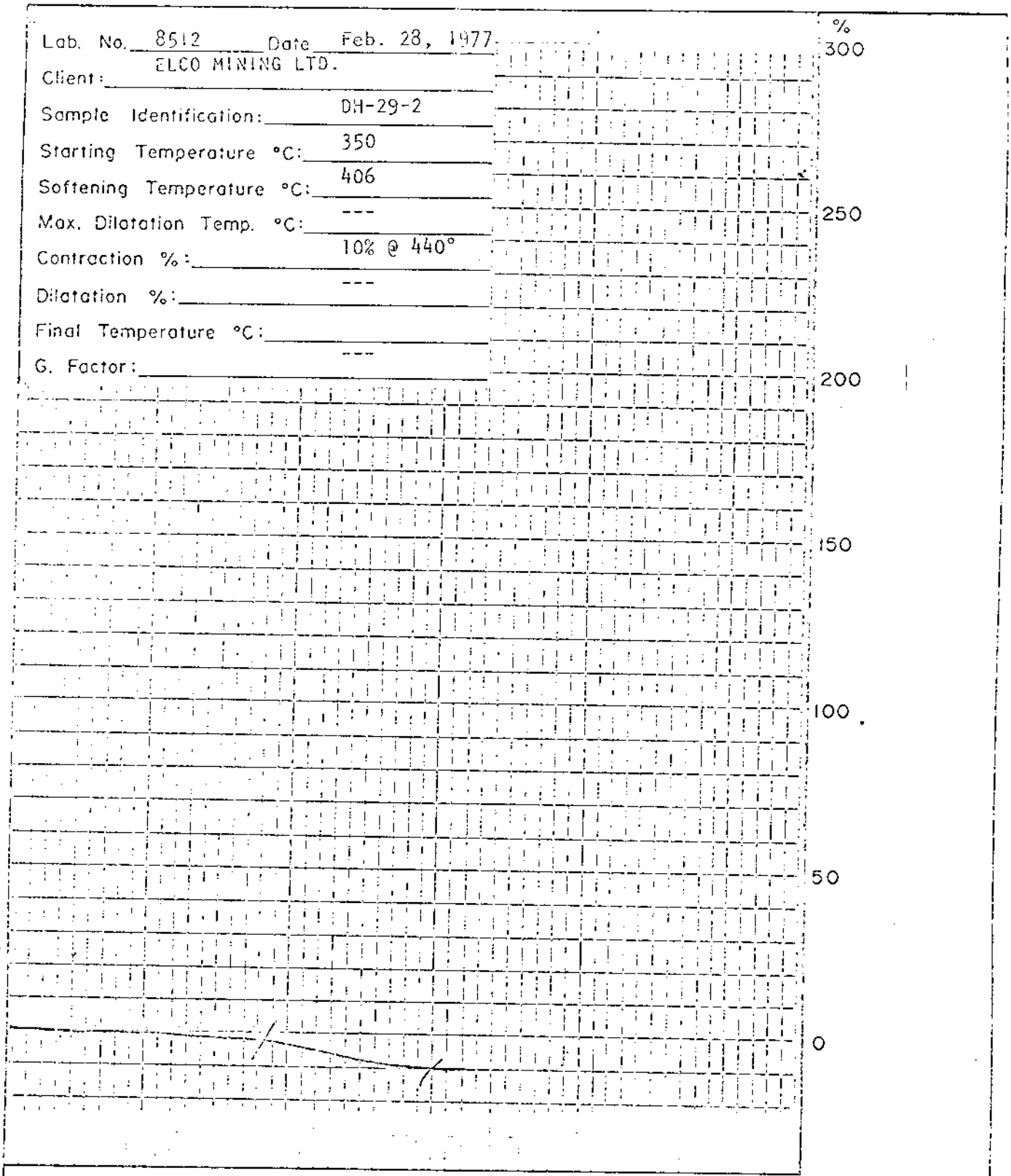
Max. Dilatation Temp. °C: ---

Contraction %: 10% @ 440°

Dilatation %: ---

Final Temperature °C: ---

G. Factor:



BARTLEY ENGINEERING (CANADA) LTD.

Title

RUHR DILATOMETER TEST

Date

Drawn

ELCO MINING LTD.

CORE SAMPLE ANALYSIS

HOLE NO.: DH - 29 - 3 Lab. No. 8513 DATE: March/77

HEAD RAW ANALYSIS						
R.M. %	ASH %	V.M. %	F.C. %	S. %	H.G.I.	REMARKS
0.8	29.0	16.7	53.5	0.46	74	Air Dried Basis
	29.2	16.8	54.0	0.46	--	Dry Basis

SIZE/RAW ANALYSES								
SIZE FRACTION	WT. %	R.M. %	ASH %	S. %	CUMULATIVE WT. %	CUMULATIVE ASH %	CUMULATIVE S. %	
1/4" x 65M	90.2	0.9	29.4	0.47	90.2	29.4	0.47	A.D.B.
	90.2		29.6	0.47	90.2	29.6	0.47	D.B.
65M x 0	9.8	0.9	18.3	0.48	100.0	28.3	0.47	A.D.B.
	9.8		18.4	0.48	100.0	28.5	0.47	D.B.

SINK-FLOAT ANALYSIS: 1/4" x 65M									
S. G.	WT. %	R.M. %	ASH %	V.M. %	F.C. %	S. %	CUMULATIVE WT. %	CUMULATIVE ASH %	
-1.40	54.7	1.1	5.8	19.5	73.6	0.68	54.7	5.8	A.D.B.
	54.7		5.9	19.7	74.4	0.69	54.7	5.9	D.B.
1.40-1.50	10.1	1.0	14.3	18.0	66.7	0.60	64.8	7.1	A.D.B.
	10.0		14.4	18.2	67.4	0.61	64.7	7.2	D.B.
1.50-1.60	2.9	0.7	27.1				67.7	8.0	A.D.B.
	2.9		27.3				67.6	8.1	D.B.
+1.60	32.3	0.8	71.2				100.0	28.4	A.D.B.
	32.4		71.8				100.0	28.7	D.B.

COMPOSITE 1/4" x 65M FLOATS @ 1.50 S.G., A.D.B.						
F.S.I.	PX ON COAL	DILATATION TEST				
		SOFTENING TEMP. (°C)	MAX. DIL. TEMP. (°C)	MAXIMUM CONTR. %	MAXIMUM DIL. %	G. NO.
7	.04	404	---	9% @ 437°	---	---

Birtley Engineering

Subsidiary of Great West Steel Industries

Lab. No. 8513 Date Feb. 28, 1977

Client: ELCO MINING LTD.

Sample Identification: DH-29-3

Starting Temperature °C: 350

Softening Temperature °C: 404

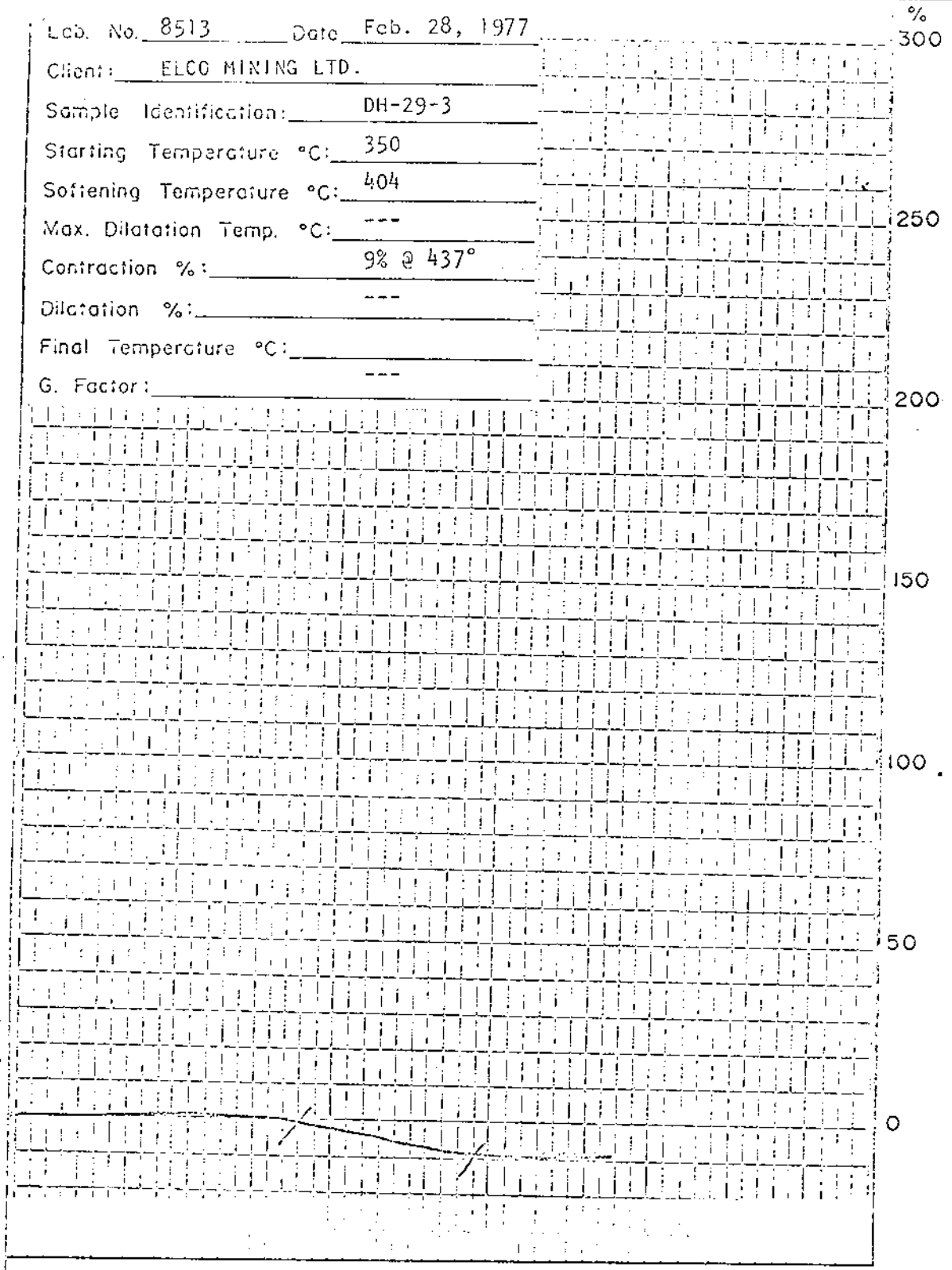
Max. Dilatation Temp. °C: ---

Contraction %: 9% @ 437°

Dilatation %: ---

Final Temperature °C:

G. Factor: ---



BARTLEY ENGINEERING (CANADA) LTD.

Title	Date
RUHR DILATOMETER TEST	
	Drawn

ELCO MINING LTD.

CORE SAMPLE ANALYSIS

HOLE NO.: DH - 29 - 4 Lab. No. 8514 DATE: March/77

HEAD RAW ANALYSIS						
R.M. %	ASH %	V.M. %	F.C. %	S. %	H.G.I.	REMARKS
0.8	40.1	14.2	44.9	0.48	82	Air Dried Basis
	40.4	14.3	45.3	0.48	--	Dry Basis

SIZE/RAW ANALYSES								
SIZE FRACTION	WT. %	R.M. %	ASH %	S. %	CUMULATIVE WT. %	CUMULATIVE ASH %	CUMULATIVE S. %	
1/4" x 65M	87.2	1.6	41.6	0.50	87.2	41.6	0.50	A.D.B.
	87.2		42.3	0.51	87.2	42.3	0.51	D.B.
65M x 0	12.8	0.9	21.6	0.58	100.0	39.0	0.51	A.D.B.
	12.8		21.8	0.59	100.0	39.7	0.52	D.B.

SINK-FLOAT ANALYSIS: 1/4" x 65M									
S. G.	WT. %	R.M. %	ASH %	V.M. %	F.C. %	S. %	CUMULATIVE WT. %	CUMULATIVE ASH %	
-1.40	33.0	2.6	5.3	18.7	73.4	0.86	33.0	5.3	A.D.B.
	32.7		5.4	19.2	75.4	0.88	32.7	5.4	D.B.
1.40-1.50	9.6	1.1	15.4	17.8	65.7	0.56	42.6	7.6	A.D.B.
	9.7		15.6	18.0	66.4	0.57	42.4	7.7	D.B.
1.50-1.60	6.9	1.2	26.0				49.5	10.1	A.D.B.
	6.9		26.3				49.3	10.3	D.B.
+1.60	50.5	1.1	72.5				100.0	41.6	A.D.B.
	50.7		73.3				100.0	42.3	D.B.

COMPOSITE 1/4" x 65M FLOATS @ 1.50 S.G., A.D.B.						
F.S.I.	P% ON COAL	DILATATION TEST				
		SOFTENING TEMP. (°C)	MAX. DIL. TEMP. (°C)	MAXIMUM CONTR. %	MAXIMUM DIL. %	G. NO.
6	.03	404	---	15% @ 437°	---	---

Birtley Engineering

Subsidiary of Great West Steel Industries

Lab. No. 8514 Date Feb. 28, 1977

Client: ELCO MINING LTD.

Sample Identification: DH-29-4

Starting Temperature °C: 350

Softening Temperature °C: 404

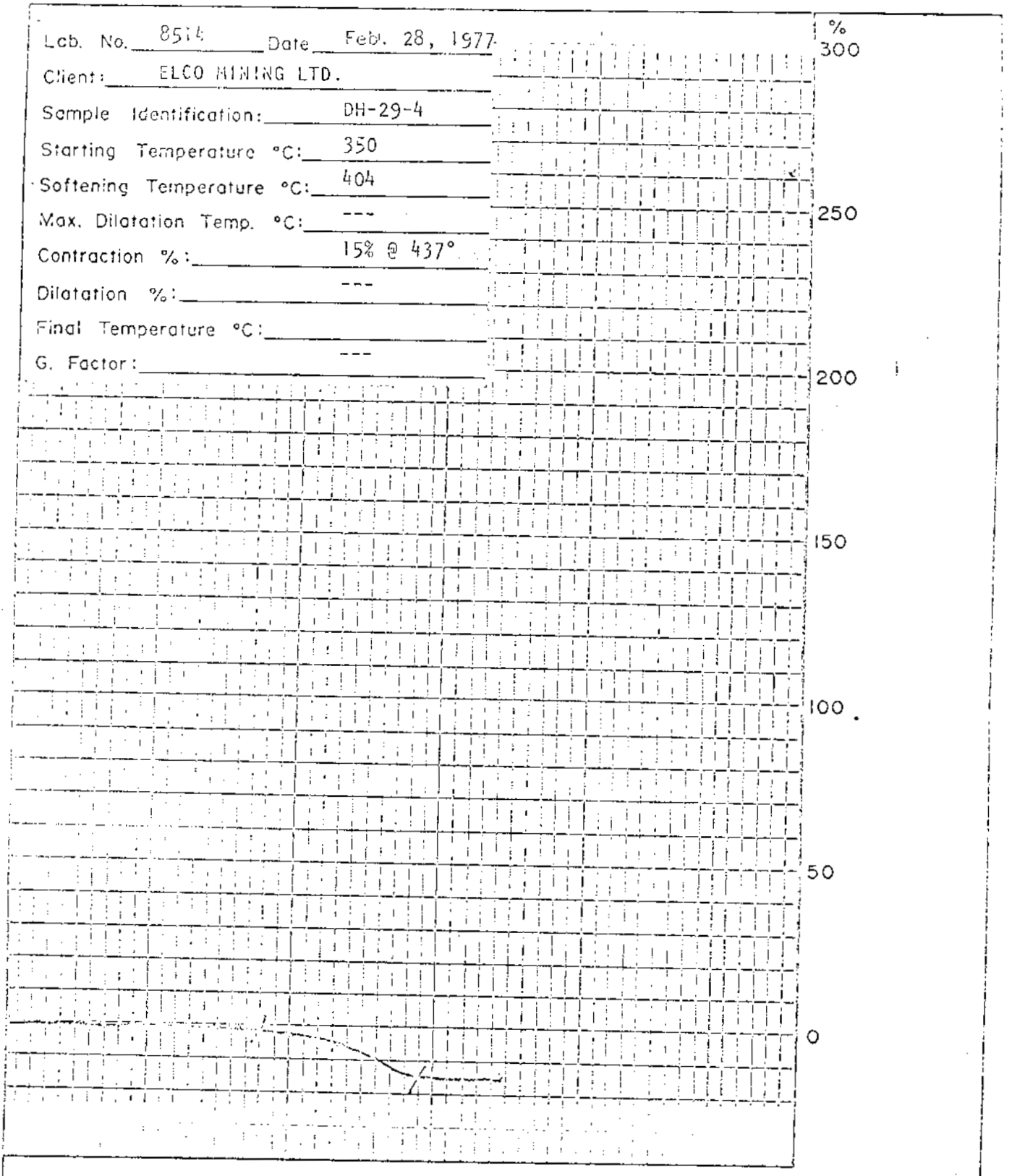
Max. Dilatation Temp. °C: ---

Contraction %: 15% @ 437°

Dilatation %: ---

Final Temperature °C:

G. Factor: ---



BIRTLEY ENGINEERING (CANADA) LTD.

Title

RUHR DILATOMETER TEST

Date

Drawn

ELCO MINING LTD.

CORE SAMPLE ANALYSIS

HOLE NO.: DH - 29 - 5 Lab. No. 8515 DATE: March/77

HEAD RAW ANALYSIS						
R.M. %	ASH %	V.M. %	F.C. %	S. %	H.G.I.	REMARKS
0.5	12.7	16.9	69.9	0.68	75	Air Dried Basis
	12.8	17.0	70.2	0.68	--	Dry Basis

SIZE / RAW ANALYSES								
SIZE FRACTION	WT. %	R.M. %	ASH %	S. %	CUMULATIVE WT. %	CUMULATIVE ASH %	CUMULATIVE S. %	
1/4" x 65M	89.6	0.8	12.7	0.70	89.6	12.7	0.70	A.D.B.
	89.6		12.8	0.71	89.6	12.8	0.71	D.B.
65M x 0	10.4	0.6	11.9	0.69	100.0	12.6	0.70	A.D.B.
	10.4		12.0	0.69	100.0	12.6	0.71	D.B.

SINK - FLOAT ANALYSIS: 1/4" x 65M									
S. G.	WT. %	R.M. %	ASH %	V.M. %	F.C. %	S. %	CUMULATIVE WT. %	CUMULATIVE ASH %	
-1.40	75.6	0.8	7.2	17.6	74.4	0.69	75.6	7.2	A.D.B.
	75.6		7.3	17.7	75.0	0.70	75.6	7.3	D.B.
1.40-1.50	13.6	0.6	17.5	16.7	65.2	0.80	89.2	8.8	A.D.B.
	13.6		17.6	16.8	65.6	0.80	89.2	8.9	D.B.
1.50-1.60	3.2	0.7	27.7				92.4	9.4	A.D.B.
	3.2		27.9				92.4	9.5	D.B.
+1.60	7.6	0.8	52.7				100.0	12.7	A.D.B.
	7.6		53.1				100.0	12.8	D.B.

COMPOSITE 1/4" x 65M FLOATS @ 1.50 S.G., A.D.B.						
F.S.I.	% ON COAL	DILATATION TEST				
		SOFTENING TEMP. (°C)	MAX. DIL. TEMP. (°C)	MAXIMUM CONTR. %	MAXIMUM DIL. %	G. NO.
3 1/2	.08	413	---	9% @ 443°	---	---

Birtley Engineering

Subsidiary of Great West Steel Industries

Lab. No. 8515 Date Feb. 28, 1977.

Client: ELCO MINING LTD.

Sample Identification: DH-29-5

Starting Temperature °C: 350

Softening Temperature °C: 413

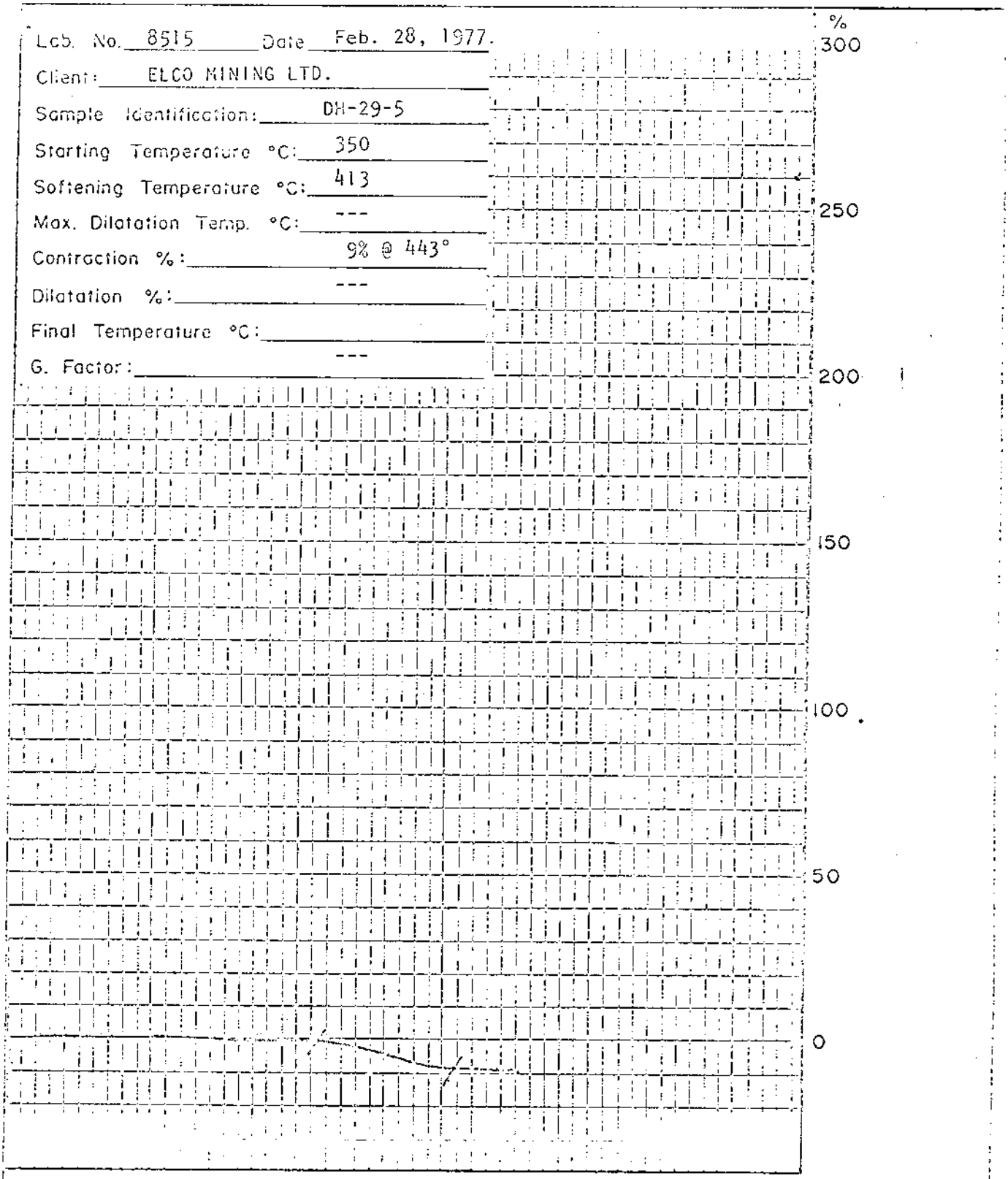
Max. Dilatation Temp. °C: ---

Contraction %: 9% @ 443°

Dilatation %: ---

Final Temperature °C:

G. Factor: ---



BIRTLEY ENGINEERING (CANADA) LTD.

Title	Date
RUHR DILATOMETER TEST	
	Drawn

Lab. No. 7902 Date Nov. 24, 1976

Client: ELCO MINING LTD.

Sample Identification: DH-29-5

Starting Temperature °C: 360

Softening Temperature °C: 403

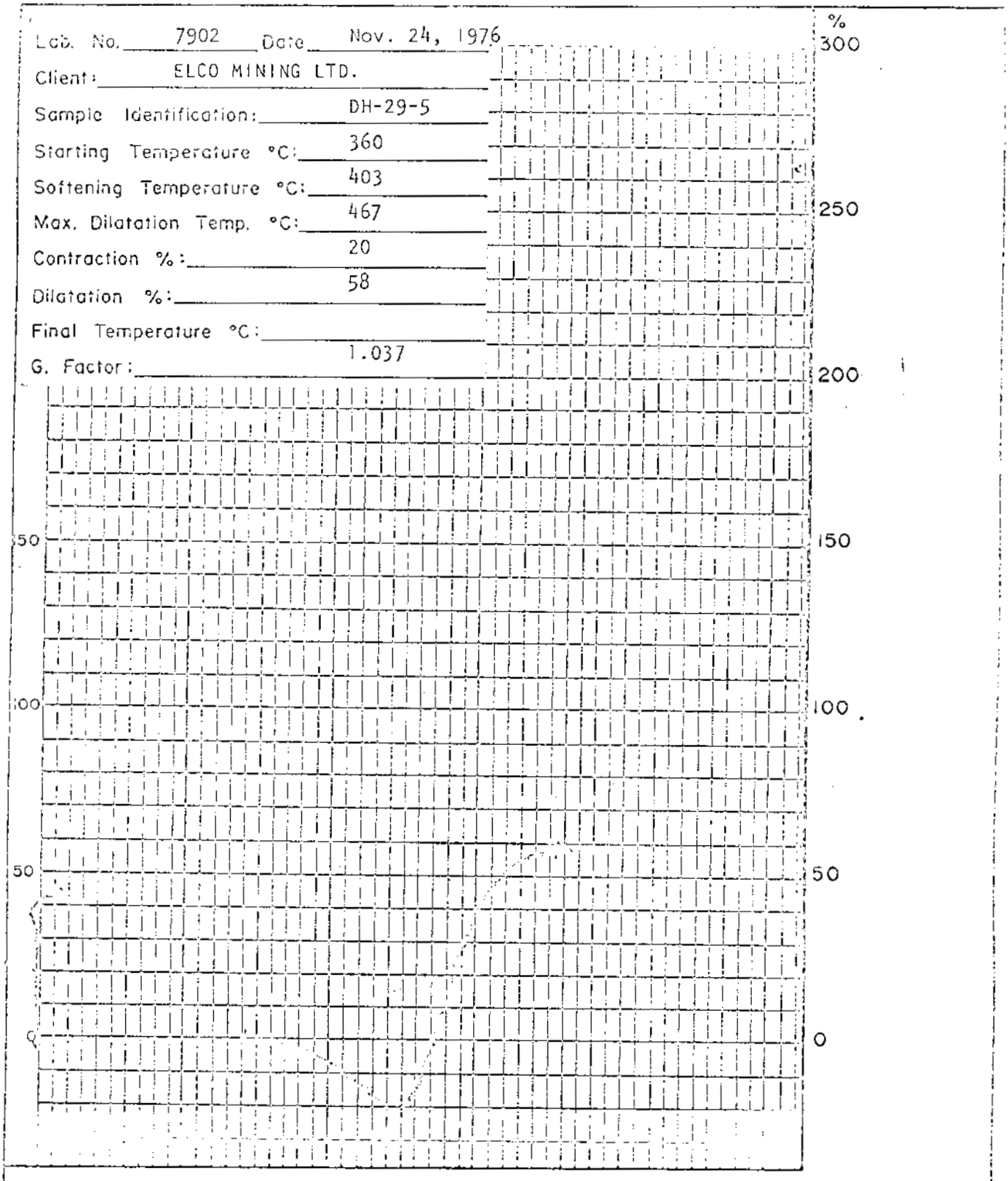
Max. Dilatation Temp. °C: 467

Contraction %: 20

Dilatation %: 58

Final Temperature °C:

G. Factor: 1.037



BIRTLEY ENGINEERING (CANADA) LTD.

Title	Date
RUHR DILATOMETER TEST	
	Drawn

ELCO MINING LTD.

CORE SAMPLE ANALYSIS

HOLE NO.: DH - 29 - 6 Lab. No. 8516 DATE: March/77

HEAD RAW ANALYSIS						
R.M. %	ASH %	V.M. %	F.C. %	S. %	H.G.I.	REMARKS
0.6	26.5	15.4	57.5	0.43	88	Air Dried Basis
	26.7	15.5	57.8	0.43	--	Dry Basis

SIZE / RAW ANALYSES								
SIZE FRACTION	WT. %	R.M. %	ASH %	S. %	CUMULATIVE WT. %	CUMULATIVE ASH %	CUMULATIVE S. %	
1/4" x 65M	90.3	1.7	27.9	0.42	90.3	27.9	0.42	A.D.B.
	90.3		28.4	0.43	90.3	28.4	0.43	D.B.
65M x 0	9.7	0.6	16.7	0.52	100.0	26.8	0.43	A.D.B.
	9.7		16.8	0.52	100.0	27.3	0.44	D.B.

SINK-FLOAT ANALYSIS: 1/4" x 65M									
S. G.	WT. %	R.M. %	ASH %	V.M. %	F.C. %	S. %	CUMULATIVE WT. %	CUMULATIVE ASH %	
-1.40	56.6	2.3	5.4	18.1	74.2	0.70	56.6	5.4	A.D.B.
	56.3		5.5	18.5	76.0	0.72	56.3	5.5	D.B.
1.40-1.50	9.9	1.1	15.7	16.3	66.9	0.44	66.5	6.9	A.D.B.
	10.0		15.9	16.5	67.6	0.44	66.3	7.1	D.B.
1.50-1.60	3.8	1.3	27.3				70.3	8.0	A.D.B.
	3.8		27.7				70.1	8.2	D.B.
+1.60	29.7	1.0	75.0				100.0	27.9	A.D.B.
	29.9		75.8				100.0	28.4	D.B.

COMPOSITE 1/4" x 65M FLOATS @ 1.50 S.G., A.D.B.						
F.S.I.	P% ON COAL	DILATATION TEST				
		SOFTENING TEMP. (°C)	MAX. DIL. TEMP. (°C)	MAXIMUM CONTR. %	MAXIMUM DIL. %	G. NO.
3 1/2	.04	410	---	9% @ 455°	---	---

Birtley Engineering

Subsidiary of Great West Steel Industries

Lab. No. 8516 Date March 2, 1977

Client: ELCO MINING LTD.

Sample Identification: DH-29-6

Starting Temperature °C: 350

Softening Temperature °C: 410

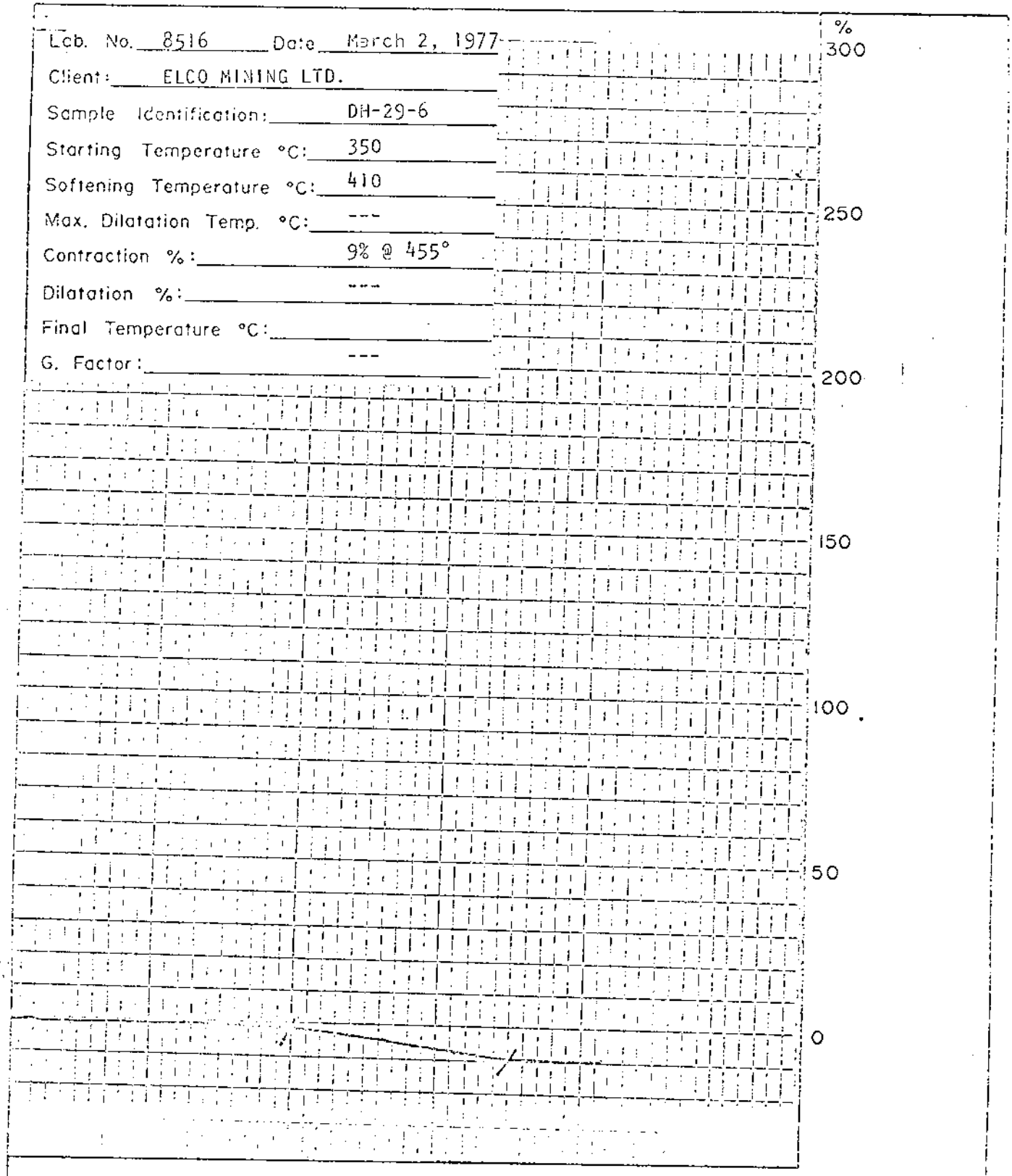
Max. Dilatation Temp. °C: ---

Contraction %: 9% @ 455°

Dilatation %: ---

Final Temperature °C:

G. Factor: ---



BIRTLEY ENGINEERING (CANADA) LTD.

Title

RUHR DILATOMETER TEST

Date

Drawn

ELCO MINING LTD.

CORE SAMPLE ANALYSIS

HOLE NO.: DH - 29 - 7 Lab. No. 8517 DATE: March/77

HEAD RAW ANALYSIS						
R.M. %	ASH %	V.M. %	F.C. %	S. %	H.G.I.	REMARKS
0.8	18.3	17.3	63.6	0.41	90	Air Dried Basis
	18.4	17.4	64.2	0.41	--	Dry Basis

SIZE / RAW ANALYSES								
SIZE FRACTION	WT. %	R.M. %	ASH %	S. %	CUMULATIVE WT. %	CUMULATIVE ASH %	CUMULATIVE S. %	
1/4" x 65M	88.9	1.1	18.8	0.43	88.9	18.8	0.43	A.D.B.
	88.9		19.0	0.43	88.9	19.0	0.43	D.B.
65M x 0	11.1	1.0	10.8	0.53	100.0	17.9	0.44	A.D.B.
	11.1		10.9	0.54	100.0	18.1	0.44	D.B.

SINK - FLOAT ANALYSIS: 1/4" x 65M									
S. G.	WT. %	R.M. %	ASH %	V.M. %	F.C. %	S. %	CUMULATIVE WT. %	CUMULATIVE ASH %	
-1.40	69.4	1.3	5.5	18.1	65.1	0.61	69.4	5.5	A.D.B.
	69.3		5.6	18.3	76.1	0.62	69.3	5.6	D.B.
1.40-1.50	10.3	0.8	16.8	16.9	65.5	0.48	79.7	7.0	A.D.B.
	10.3		16.9	17.0	66.1	0.48	79.6	7.1	D.B.
1.50-1.60	3.5	0.8	26.3				83.2	7.8	A.D.B.
	3.5		26.5				83.1	7.9	D.B.
+1.60	16.8	0.8	70.5				100.0	18.3	A.D.B.
	16.9		71.1				100.0	18.6	D.B.

COMPOSITE 1/4" x 65M FLOATS @ 1.50 S.G., A.D.B.						
F.S.I.	P% ON COAL	DILATATION TEST SOFTENING TEMP. (°C)	MAX. DIL. TEMP. (°C)	MAXIMUM CONTR. %	MAXIMUM DIL. %	G. NO.
7	.05	407	467	17	- 2	0.920

Birtley Engineering

Subsidiary of Great West Steel Industries

Lab. No. 8517 Date March 2, 1977.

Client: ELCO MINING LTD.

Sample Identification: DH-29-7

Starting Temperature °C: 350

Softening Temperature °C: 407

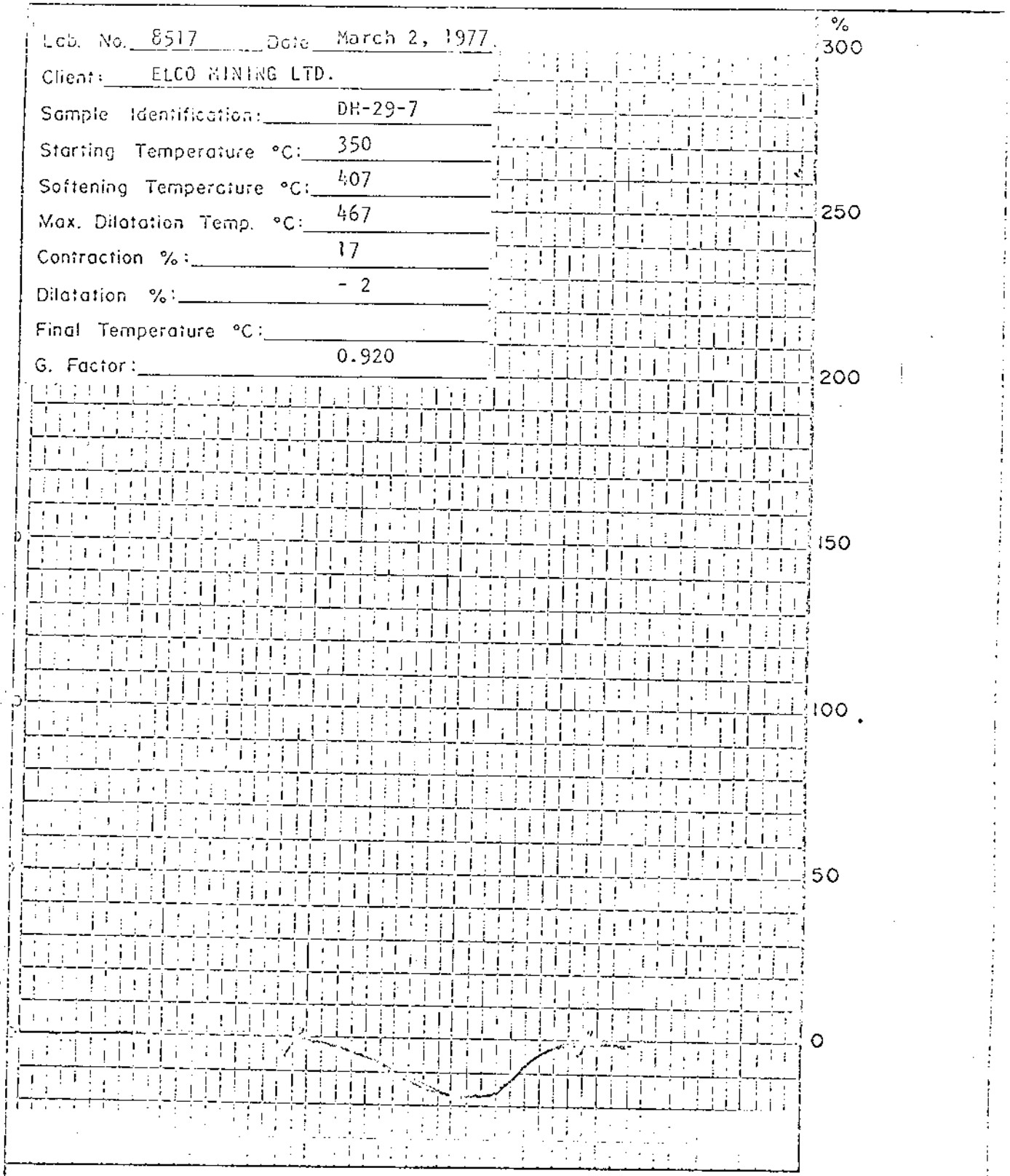
Max. Dilatation Temp. °C: 467

Contraction %: 17

Dilatation %: - 2

Final Temperature °C:

G. Factor: 0.920



BIRTLEY ENGINEERING (CANADA) LTD.

Title

RUHR DILATOMETER TEST

Date

Drawn

Warnock Hersey Professional Services Ltd.

ELCO MINING LTD. CORE SAMPLE ANALYSIS

Hole No.: DH 29 - 8 Lab. No.: 77 - 3057 Date: March 28, 1977

HEAD RAW ANALYSIS						
R.M.%	Ash%	V.M.%	F.C.%	S.%	H.G.I.	REMARKS
0.4	12.1	18.0	69.5	0.54	137.7	Air Dried Basis
- -	12.2	18.0	69.8	0.54	- - -	Dry Basis

SIZE / RAW ANALYSES								
Size Fraction	Wt. %	R.M.%	Ash %	S. %	CUMULATIVE Wt. %	CUMULATIVE Ash %	CUMULATIVE S. %	
¼ x 65	89.2	0.4	12.1	0.47	89.2	12.1	0.47	A.D.B.
	89.2	- -	12.1	0.47	89.2	12.1	0.47	D.B.
65 x 0	10.8	0.4	9.9	0.54	100.0	11.9	0.48	A.D.B.
	10.8	- -	9.9	0.54	100.0	11.9	0.48	D.B.

SINK - FLOAT ANALYSIS: ¼" x 65 M									
S. G.	Wt.%	R.M%	Ash %	V.M%	F.C%	S.%	Cumulative Wt. %	Cumulative Ash %	
-1.40	78.2	0.7	6.3	20.4	72.6	0.46	78.2	6.3	A.D.B.
	78.2	- -	6.3	20.6	73.1	0.46	78.2	6.3	D.B.
1.40-1.50	11.1	0.7	12.8	19.3	67.2	0.40	89.3	7.1	A.D.B.
	11.1	- -	12.9	19.4	67.7	0.40	89.3	7.1	D.B.
1.50-1.60	2.5	1.0	17.4	- - -	- - -	- - -	91.8	7.4	A.D.B.
	2.5	- - -	17.5	- - -	- - -	- - -	91.8	7.4	D.B.
+1.60	8.2	1.1	73.8	- - -	- - -	- - -	100.0	12.8	A.D.B.
	8.2	- -	74.4	- - -	- - -	- - -	100.0	12.9	D.B.

COMPOSITE ¼" x 65 m FLOATS @ 1.50 S.G., A.D.B.						
F.S.I.	F % on Coal	DILATATION TESTS Softening Temp.(°C)	Max. Dil. Temp.(°C)	Maximum Contr. %	Maximum Dil. %	G.No.
7½	0.023					

Warnock Hersey Professional Services Ltd.

ELCO MINING LTD. CORE SAMPLE ANALYSIS

Hole No.: DH 29 – 9 Lab. No.: 77 – 3058 Date: March 28, 1977

HEAD RAW ANALYSIS						
R.M.%	Ash%	V.M.%	F.C.%	S.%	H.G.I.	REMARKS
0.5	17.4	18.0	64.1	0.52	103.1	Air Dried Basis
– –	17.5	18.1	64.4	0.52	– – –	Dry Basis

SIZE / RAW ANALYSES								
Size Fraction	Wt. %	R.M.%	Ash %	S. %	CUMULATIVE Wt. %	CUMULATIVE Ash %	CUMULATIVE S. %	
¼ x 65	86.5	0.4	17.5	0.50	86.5	17.5	0.50	A.D.B.
	86.5	– –	17.6	0.50	86.5	17.6	0.50	D.B.
65 x 0	13.5	0.5	17.0	0.56	100.0	17.4	0.51	A.D.B.
	13.5	– –	17.1	0.56	100.0	17.5	0.51	D.B.

SINK – FLOAT ANALYSIS: ¼" x 65 M									
S. G.	Wt.%	R.M%	Ash %	V.M%	F.C%	S.%	Cumulative Wt. %	Cumulative Ash %	
-1.40	59.6	1.0	6.5	22.3	70.2	0.47	59.6	6.5	A.D.B.
	59.6	– –	6.6	22.5	70.9	0.47	59.6	6.6	D.B.
1.40-1.50	21.0	0.7	15.2	17.7	66.4	0.37	80.6	8.8	A.D.B.
	21.0	– –	15.3	17.8	66.9	0.37	80.6	8.9	D.B.
1.50-1.60	6.4	0.8	21.0	– –	– –	– –	87.0	9.7	A.D.B.
	6.4	– –	21.2	– –	– –	– –	87.0	9.8	D.B.
+1.60	13.0	0.9	64.5	– –	– –	– –	100.0	16.8	A.D.B.
	13.0	– –	65.1	– –	– –	– –	100.0	17.0	D.B.

COMPOSITE ¼" x 65 m FLOATS @ 1.50 S.G., A.D.B.						
F.S.I.	P % on Coal	DILATATION TESTS Softening Temp.(°C)	Max. Dil. Temp.(°C)	Maximum Contr. %	Maximum Dil. %	G.No.
8	0.010					

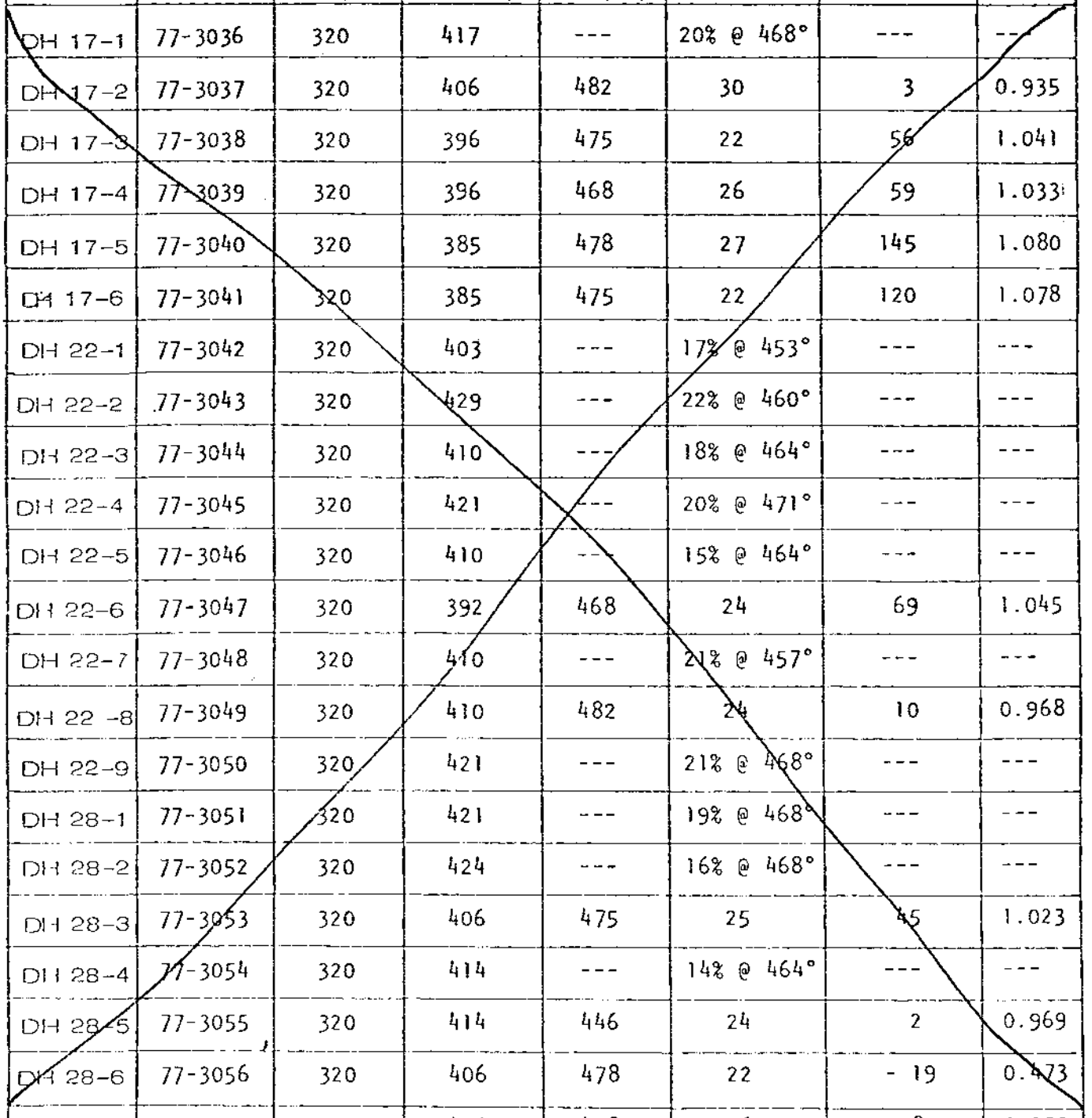
CLIENT: WARNOCK HERSEY

PROJECT: DILATATION TESTS *

SAMPLE : -8 Mesh, 1.50 S.G. Floats
Composite

DATE: March 30, 1977

Well No.	W.H. I.D. No.	INITIAL TEMP(°C)	SOFTENING TEMP(°C)	MAX. DILAT'N TEMP(°C)	MAX. CONTRACT'N %	MAX. DILATATION %	G.No.
DH 17-1	77-3036	320	417	---	20% @ 468°	---	---
DH 17-2	77-3037	320	406	482	30	3	0.935
DH 17-3	77-3038	320	396	475	22	56	1.041
DH 17-4	77-3039	320	396	468	26	59	1.033
DH 17-5	77-3040	320	385	478	27	145	1.080
DH 17-6	77-3041	320	385	475	22	120	1.078
DH 22-1	77-3042	320	403	---	17% @ 453°	---	---
DH 22-2	77-3043	320	429	---	22% @ 460°	---	---
DH 22-3	77-3044	320	410	---	18% @ 464°	---	---
DH 22-4	77-3045	320	421	---	20% @ 471°	---	---
DH 22-5	77-3046	320	410	---	15% @ 464°	---	---
DH 22-6	77-3047	320	392	468	24	69	1.045
DH 22-7	77-3048	320	410	---	21% @ 457°	---	---
DH 22 -8	77-3049	320	410	482	24	10	0.968
DH 22-9	77-3050	320	421	---	21% @ 468°	---	---
DH 28-1	77-3051	320	421	---	19% @ 468°	---	---
DH 28-2	77-3052	320	424	---	16% @ 468°	---	---
DH 28-3	77-3053	320	406	475	25	45	1.023
DH 28-4	77-3054	320	414	---	14% @ 464°	---	---
DH 28-5	77-3055	320	414	446	24	2	0.969
DH 28-6	77-3056	320	406	478	22	- 19	0.973
DH 29-8	77-3057	320	406	478	26	8	0.959
DH 29-9	77-3058	320	403	478	24	22	0.996



* Softening Temp., Maximum Dilatation/Contraction Temp. are corrected with factor = 6/5

ELCO MINING LTD.

CORE SAMPLE ANALYSIS

HOLE NO.: DH - 30 - 1 Lab. No. 8518 DATE: March/77

HEAD RAW ANALYSIS						
R.M. %	ASH %	V.M. %	F.C. %	S. %	H.G.I.	REMARKS
0.9	16.5	20.0	62.6	0.47	80	Air Dried Basis
	16.6	20.2	63.2	0.47	--	Dry Basis

SIZE/RAW ANALYSES								
SIZE FRACTION	WT. %	R.M. %	ASH %	S. %	CUMULATIVE WT. %	CUMULATIVE ASH %	CUMULATIVE S. %	
1/4" x 65M	92.8	0.8	16.9	0.47	92.8	16.9	0.47	A.D.B.
	92.8		17.0	0.47	92.8	17.0	0.47	D.B.
65M x 0	7.2	1.0	11.3	0.48	100.0	16.5	0.47	A.D.B.
	7.2		11.4	0.48	100.0	16.6	0.47	D.B.

SINK-FLOAT ANALYSIS: 1/4" x 65M									
S. G.	WT. %	R.M. %	ASH %	V.M. %	F.C. %	S. %	CUMULATIVE WT. %	CUMULATIVE ASH %	
-1.40	74.8	0.8	5.1	21.2	72.9	0.46	74.8	5.1	A.D.B.
	74.8		5.1	21.4	73.5	0.46	74.8	5.1	D.B.
1.40-1.50	7.4	0.9	16.7	18.3	64.1	0.43	82.2	6.1	A.D.B.
	7.4		16.9	18.5	64.6	0.43	82.2	6.2	D.B.
1.50-1.60	2.9	0.8	26.9				85.1	6.9	A.D.B.
	2.9		27.1				85.1	6.9	D.B.
+1.60	14.9	0.8	70.9				100.0	16.4	A.D.B.
	14.9		71.5				100.0	16.5	D.B.

COMPOSITE 1/4" x 65M FLOATS @ 1.50 S.G., A.D.B.						
F.S.I.	P% OF COAL	DILATATION TEST				
		SOFTENING TEMP. (°C)	MAX. DIL. TEMP. (°C)	MAXIMUM CONTR. %	MAXIMUM DIL. %	G. NO.
8	.02	386	455	15	6	0.966

Birtley Engineering

Subsidiary of Great West Steel Industries

Lab. No. 8518 Date March 1, 1977

Client: ELCO MINING LTD.

Sample Identification: DH-30-1

Starting Temperature °C: 350

Softening Temperature °C: 386

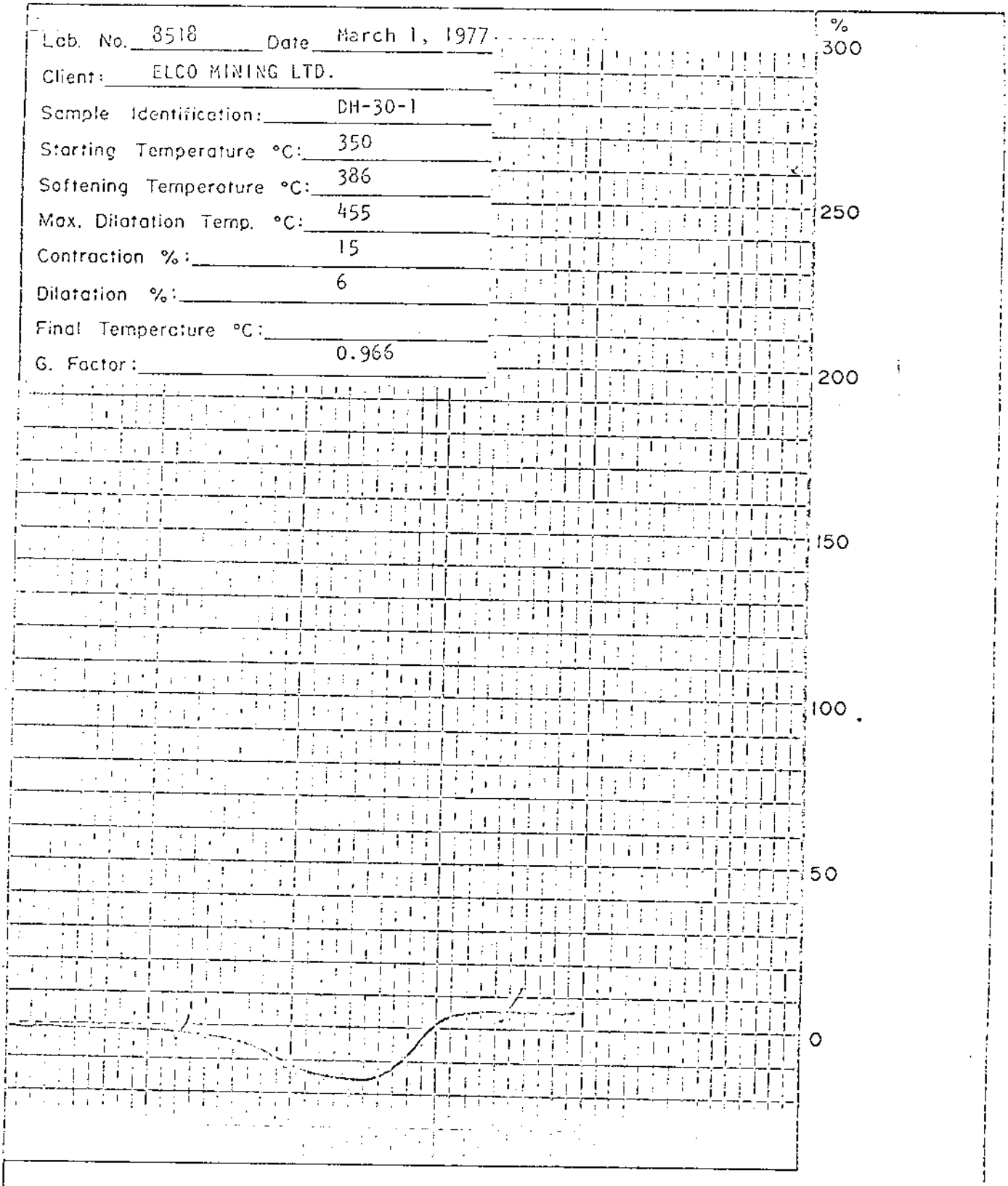
Max. Dilatation Temp. °C: 455

Contraction %: 15

Dilatation %: 6

Final Temperature °C:

G. Factor: 0.966



BARTLEY ENGINEERING (CANADA) LTD.

Title	Date
RUHR DILATOMETER TEST	
	Drawn

ELCO MINING LTD.

CORE SAMPLE ANALYSIS

HOLE NO.: DH - 30 - 2 Lab. No. 8519 DATE: March/77

HEAD RAW ANALYSIS						
R.M. %	ASH %	V.M. %	F.C. %	S. %	H.G.I.	REMARKS
0.8	30.3	17.9	51.0	0.97	73	Air Dried Basis
	30.5	18.0	51.5	0.98	--	Dry Basis

SIZE/RAW ANALYSES								
SIZE FRACTION	WT. %	R.M. %	ASH %	S. %	CUMULATIVE WT. %	CUMULATIVE ASH %	CUMULATIVE S. %	
1/4" x 65M	91.6	0.6	30.6	0.94	91.6	30.6	0.94	A.D.B.
	91.6		30.8	0.95	91.6	30.8	0.95	D.B.
65M x 0	8.4	0.8	20.6	0.88	100.0	29.8	0.93	A.D.B.
	8.4		20.8	0.89	100.0	30.0	0.94	D.B.

SINK-FLOAT ANALYSIS: 1/4" x 65M									
S. G.	WT. %	R.M. %	ASH %	V.M. %	F.C. %	S. %	CUMULATIVE WT. %	CUMULATIVE ASH %	
-1.40	43.9	0.5	6.1	20.3	73.1	0.76	43.9	6.1	A.D.B.
	44.0		6.1	20.4	73.5	0.76	44.0	6.1	D.B.
1.40-1.50	10.5	0.5	17.7	17.8	64.0	0.72	54.4	8.3	A.D.B.
	10.5		17.8	17.9	64.3	0.72	54.5	8.4	D.B.
1.50-1.60	8.1	0.6	29.2				62.5	11.0	A.D.B.
	8.1		29.4				62.6	11.1	D.B.
+1.60	37.5	0.8	61.7				100.0	30.0	A.D.B.
	37.4		62.2				100.0	30.2	D.B.

COMPOSITE 1/4" x 65M FLOATS @ 1.50 S.G., A.D.B.						
F.S.I.	% OIL ON COAL	DILATATION TEST SOFTENING TEMP. (°C)	MAX. DIL. TEMP. (°C)	MAXIMUM CONTR. %	MAXIMUM DIL. %	G. NO.
7 1/2	.02	392	458	13	- 4	0.872

Birtley Engineering

Subsidiary of Great West Steel Industries

Lab. No. 8519 Date March 1, 1977

Client: ELCO MINING LTD.

Sample Identification: DH-30-2

Starting Temperature °C: 350

Softening Temperature °C: 392

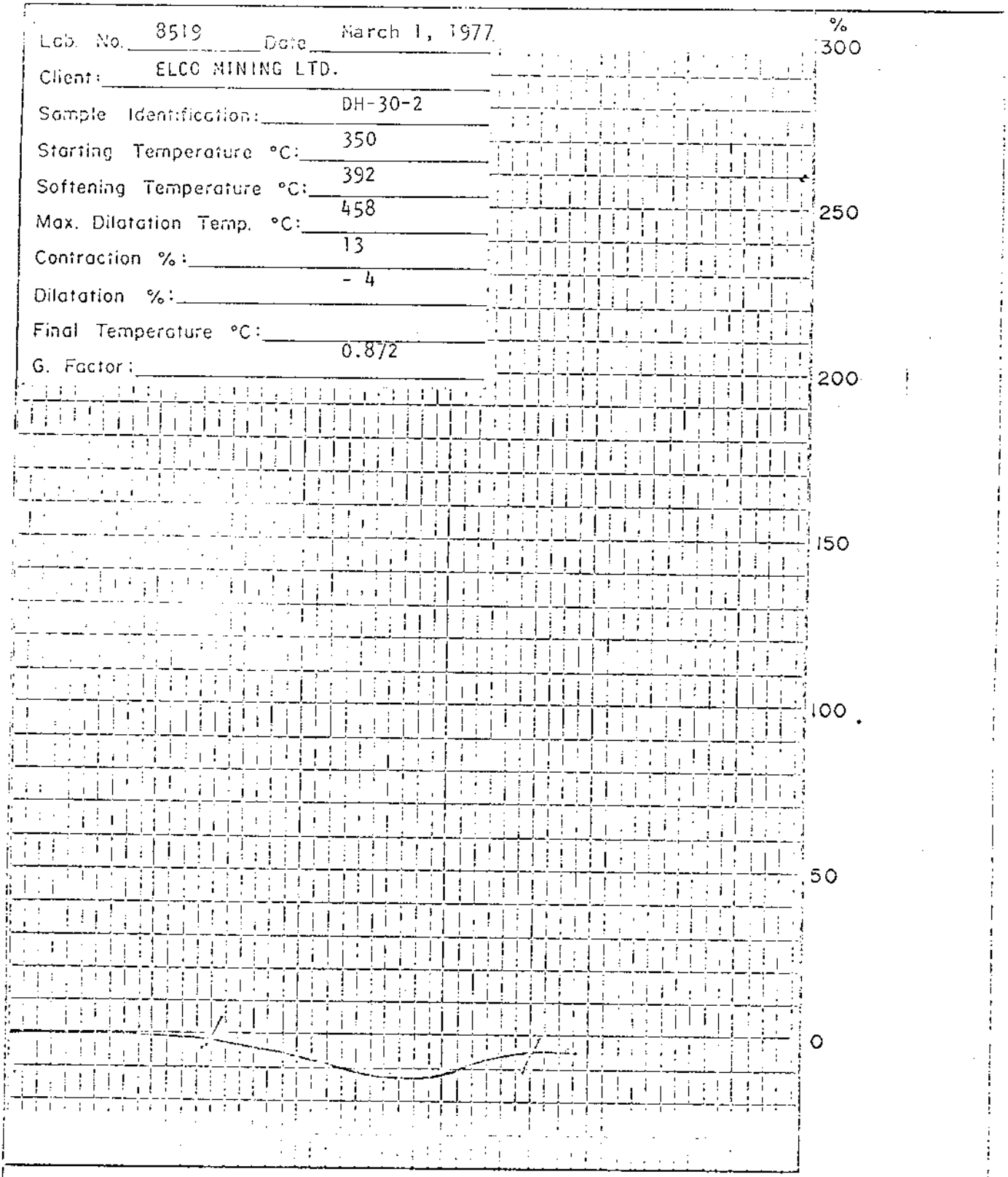
Max. Dilatation Temp. °C: 458

Contraction %: 13

Dilatation %: - 4

Final Temperature °C:

G. Factor: 0.872



BARTLEY ENGINEERING (CANADA) LTD.

Title

RUHR DILATOMETER TEST

Date

Drawn

ELCO MINING LTD.

CORE SAMPLE ANALYSIS

HOLE NO.: DH - 30 - 3 Lab. No. 8520 DATE: March/77

HEAD RAW ANALYSIS						
R.M. %	ASH %	V.M. %	F.C. %	S. %	H.G.I.	REMARKS
0.7	23.7	17.0	58.6	0.42	75	Air Dried Basis
	23.9	17.1	59.0	0.42	--	Dry Basis

SIZE / RAW ANALYSES								
SIZE FRACTION	WT. %	R.M. %	ASH %	S. %	CUMULATIVE WT. %	CUMULATIVE ASH %	CUMULATIVE S. %	
1/4" x 65M	94.4	0.7	24.0	0.41	94.4	24.0	0.41	A.D.B.
	94.4		24.2	0.41	94.4	24.2	0.41	D.B.
65M x 0	5.6	0.8	16.7	0.64	100.0	23.6	0.42	A.D.B.
	5.6		16.8	0.65	100.0	23.8	0.42	D.B.

SINK - FLOAT ANALYSIS: 1/4" x 65M									
S. G.	WT. %	R.M. %	ASH %	V.M. %	F.C. %	S. %	CUMULATIVE WT. %	CUMULATIVE ASH %	
-1.40	57.4	0.8	5.4	20.0	73.8	0.52	57.4	5.4	A.D.B.
	57.5		5.4	20.2	74.4	0.52	57.5	5.4	D.B.
1.40-1.50	13.3	0.8	17.3	17.2	64.7	0.50	70.7	7.6	A.D.B.
	13.3		17.4	17.3	65.3	0.50	70.8	7.7	D.B.
1.50-1.60	5.3	0.9	27.9				76.0	9.1	A.D.B.
	5.3		28.2				76.1	9.1	D.B.
+1.60	24.0	1.2	70.0				100.0	23.7	A.D.B.
	23.9		70.9				100.0	23.9	D.B.

COMPOSITE 1/4" x 65M FLOATS @ 1.50 S.G., A.D.B.						
F.S.I.	P% ON COAL	DILATATION TEST				
		SOFTENING TEMP. (°C)	MAX. DIL. TEMP. (°C)	MAXIMUM CONTR. %	MAXIMUM DIL. %	G. NO.
7	.04	407	---	8% @ 437°	---	---

Birtley Engineering

Subsidiary of Great West Steel Industries

Lab. No. 8520 Date March 1, 1977

Client: ELCO MINING LTD.

Sample Identification: DH-30-3

Starting Temperature °C: 350

Softening Temperature °C: 407

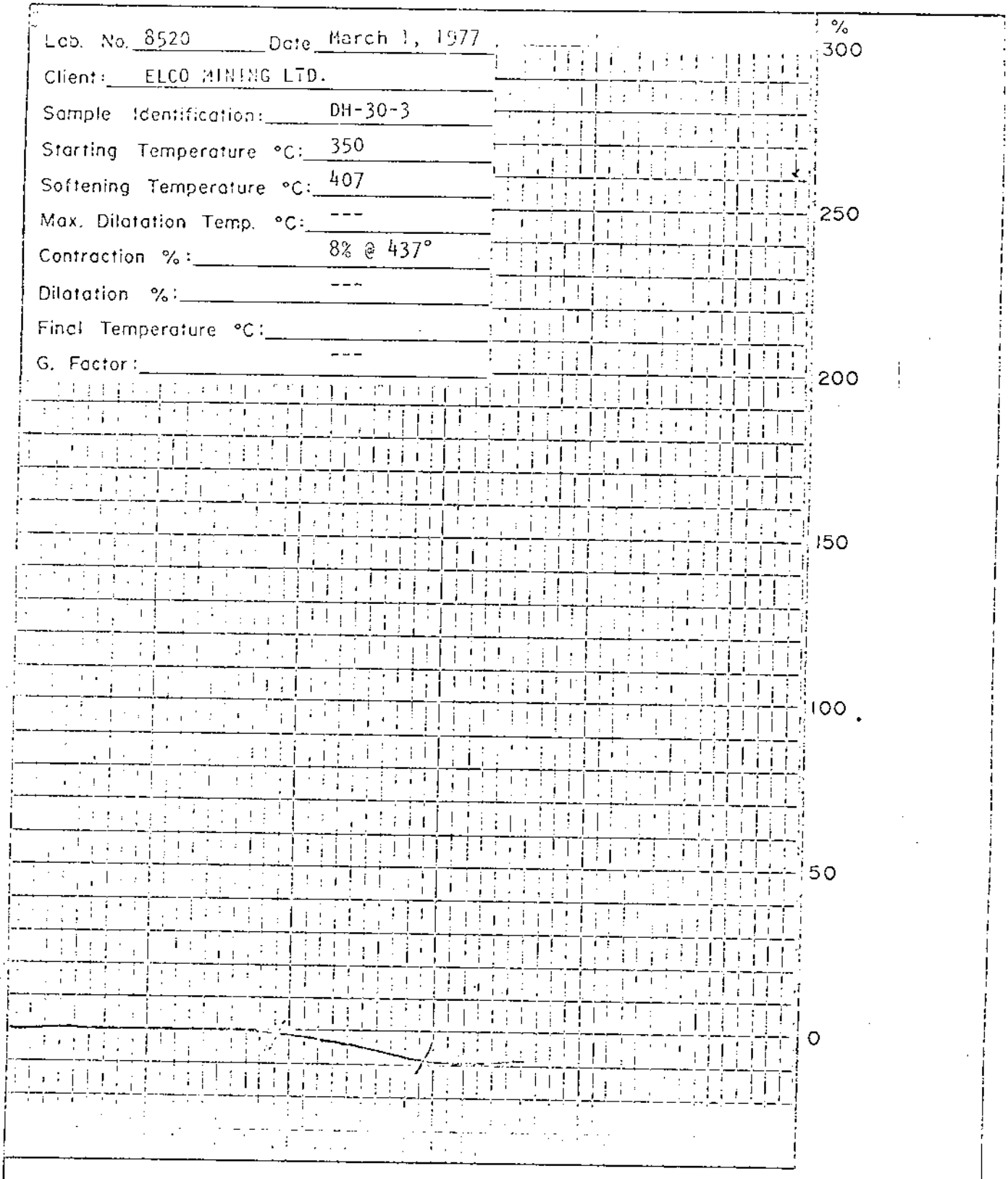
Max. Dilatation Temp. °C: ---

Contraction %: 8% @ 437°

Dilatation %: ---

Final Temperature °C: ---

G. Factor: ---



BIRTLEY ENGINEERING (CANADA) LTD.

Title

RUHR DILATOMETER TEST

Date

Drawn

ELCO MINING LTD.

CORE SAMPLE ANALYSIS

HOLE NO.: DH - 30 - 4 Lab. No. 8521 DATE: March/77

HEAD RAW ANALYSIS						
R.M. %	ASH %	V.M. %	F.C. %	S. %	H.G.I.	REMARKS
0.7	48.1	13.4	37.8	0.68	66	Air Dried Basis
	48.4	13.5	38.1	0.68	--	Dry Basis

SIZE/RAW ANALYSES								
SIZE FRACTION	WT. %	R.M. %	ASH %	S. %	CUMULATIVE WT. %	CUMULATIVE ASH %	CUMULATIVE S. %	
1/4" x 65M	87.7	1.0	51.0	0.62	87.7	51.0	0.62	A.D.B.
	87.7		51.5	0.63	87.7	51.5	0.63	D.B.
65M x 0	12.3	0.6	27.3	0.90	100.0	48.1	0.65	A.D.B.
	12.3		27.5	0.91	100.0	48.5	0.66	D.B.

SINK-FLOAT ANALYSIS: 1/4" x 65M									
S. G.	WT. %	R.M. %	ASH %	V.M. %	F.C. %	S. %	CUMULATIVE WT. %	CUMULATIVE ASH %	
-1.40	8.8	0.8	6.7	20.5	72.0	1.08	8.8	6.7	A.D.B.
	8.8		6.8	20.7	72.5	1.09	8.8	6.8	D.B.
1.40-1.50	10.3	0.8	13.9	20.0	65.3	1.06	19.1	10.6	A.D.B.
	10.3		14.0	20.2	65.8	1.07	19.1	10.7	D.B.
1.50-1.60	6.1	0.9	31.0				25.2	15.5	A.D.B.
	6.1		31.3				25.2	15.7	D.B.
+1.60	74.8	1.1	63.0				100.0	51.0	A.D.B.
	74.8		63.7				100.0	51.6	D.B.

COMPOSITE 1/4" x 65M FLOATS @ 1.50 S.G., A.D.B.						
F.S.I.	P2O5 ON COAL	DILATATION TEST				
		SOFTENING TEMP. (°C)	MAX. DIL. TEMP. (°C)	MAXIMUM CONTR. %	MAXIMUM DIL. %	G. NO.
9	.04	386	443	14	172	1.063

Birtley Engineering

Subsidiary of Great West Steel Industries

Lab. No. 8521 Date March 1, 1977

Client: ELCO MINING LTD.

Sample Identification: DH-30-4

Starting Temperature °C: 350

Softening Temperature °C: 386

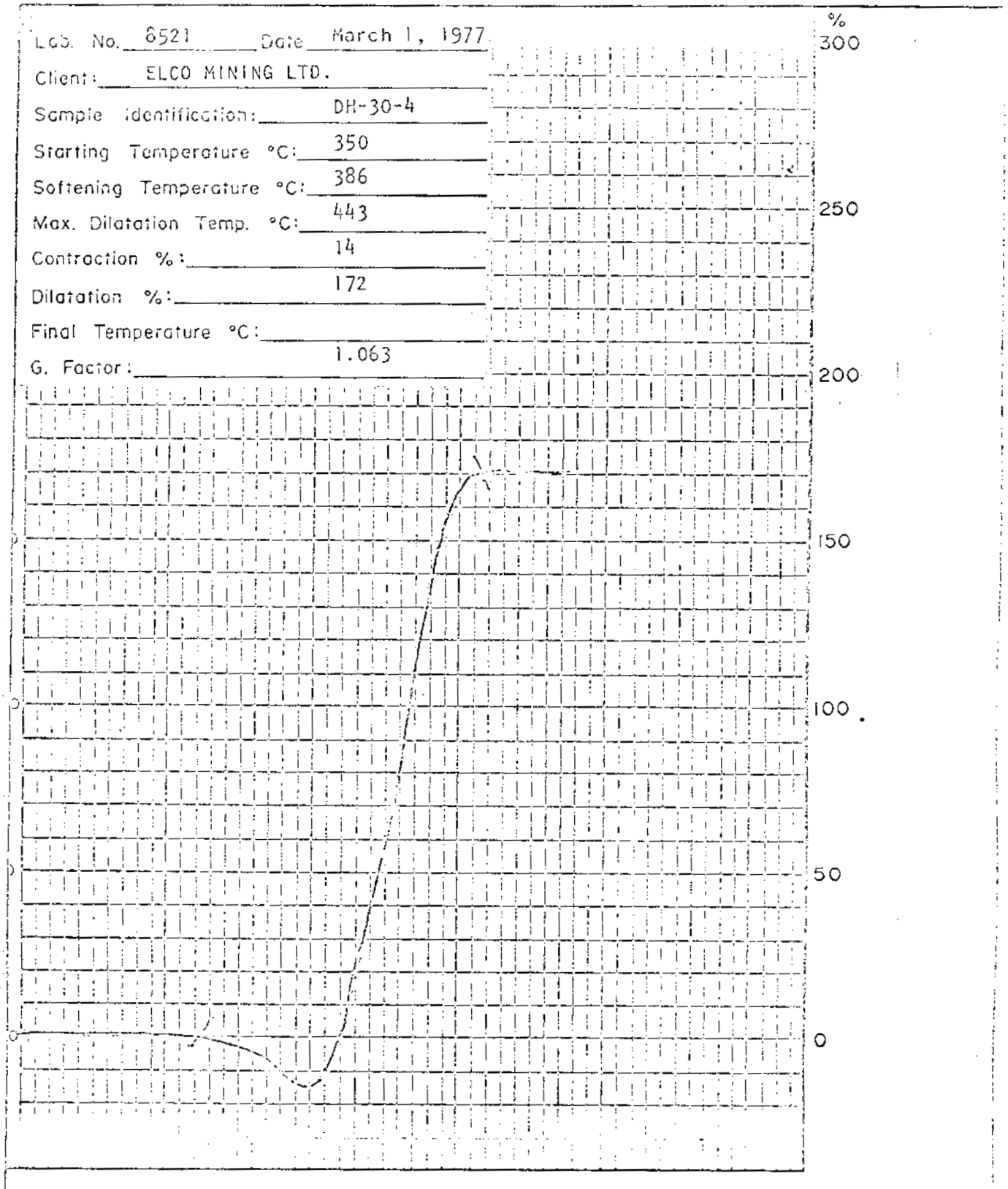
Max. Dilatation Temp. °C: 443

Contraction %: 14

Dilatation %: 172

Final Temperature °C:

G. Factor: 1.063



BIRTLEY ENGINEERING (CANADA) LTD.

Title	Date
RUHR DILATOMETER TEST	
	Drawn

ELCO MINING LTD.

CORE SAMPLE ANALYSIS

HOLE NO.: DH - 30 - 5 Lab. No. 8522 DATE: March/77

HEAD RAW ANALYSIS						
R.M. %	ASH %	V.M. %	F.C. %	S. %	H.G.I.	REMARKS
0.5	11.3	18.0	70.2	0.64	114	Air Dried Basis
	11.4	18.1	70.5	0.64	---	Dry Basis

SIZE/RAW ANALYSES								
SIZE FRACTION	WT. %	R.M. %	ASH %	S. %	CUMULATIVE WT. %	CUMULATIVE ASH %	CUMULATIVE S. %	
1/4" x 65M	90.1	3.5	12.0	0.64	90.1	12.0	0.64	A.D.B.
	90.1		12.4	0.66	90.1	12.4	0.66	D.B.
65M x 0	9.9	0.6	7.9	0.73	100.0	11.6	0.65	A.D.B.
	9.9		7.9	0.73	100.0	12.0	0.67	D.B.

SINK-FLOAT ANALYSIS: 1/4" x 65M									
S. G.	WT. %	R.M. %	ASH %	V.M. %	F.C. %	S. %	CUMULATIVE WT. %	CUMULATIVE ASH %	
-1.40	75.9	4.2	4.6	20.3	70.9	0.69	75.9	4.6	A.D.B.
	75.4		4.8	21.2	74.0	0.72	75.4	4.8	D.B.
1.40-1.50	8.5	1.1	15.6	17.0	66.3	0.56	84.4	5.7	A.D.B.
	8.7		15.8	17.2	67.0	0.57	84.1	5.9	D.B.
1.50-1.60	4.4	2.4	23.5				88.8	6.6	A.D.B.
	4.4		24.1				88.5	6.8	D.B.
+1.60	11.2	1.5	59.9				100.0	12.6	A.D.B.
	11.5		60.8				100.0	13.0	D.B.

COMPOSITE 1/4" x 65M FLOATS @ 1.50 S.G., A.D.B.						
F.S.I.	P% ON COAL	DILATATION TEST SOFTENING TEMP. (°C)	MAX. DIL. TEMP. (°C)	MAXIMUM CONTR. %	MAXIMUM DIL. %	G. NO.
6 1/2	.06	398	---	15% @ 434°	---	---

Birtley Engineering

Subsidiary of Great West Steel Industries

Lab. No. 8522 Date March 1, 1977

Client: ELCO MINING LTD.

Sample Identification: DH-30-5

Starting Temperature °C: 350

Softening Temperature °C: 398

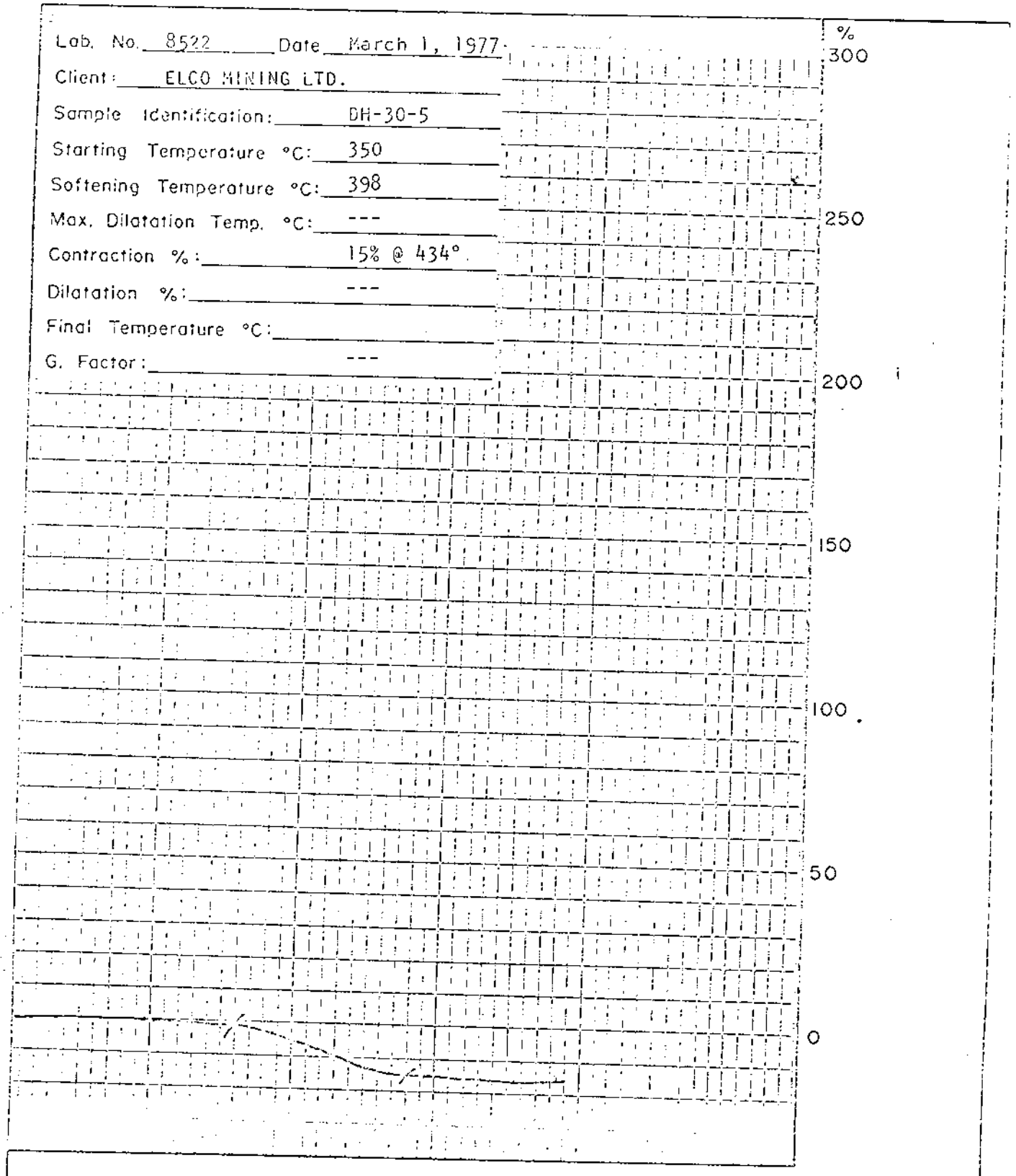
Max. Dilatation Temp. °C: ---

Contraction %: 15% @ 434°

Dilatation %: ---

Final Temperature °C:

G. Factor: ---



BIRTLEY ENGINEERING (CANADA) LTD.

Title

RUHR DILATOMETER TEST

Date

Drawn

ELCO MINING LTD.

CORE SAMPLE ANALYSIS

HOLE NO.: DH - 30 - 6 Lab. No. 8523 DATE: March/77

HEAD RAW ANALYSIS						
R.M. %	ASH %	V.M. %	F.C. %	S. %	H.G.I.	REMARKS
0.7	33.7	15.7	49.9	0.48	77	Air Dried Basis
	33.9	15.8	50.3	0.48	--	Dry Basis

SIZE/RAW ANALYSES								
SIZE FRACTION	WT. %	R.M. %	ASH %	S. %	CUMULATIVE WT. %	CUMULATIVE ASH %	CUMULATIVE S. %	
1/4" x 65M	91.8	0.9	34.3	0.50	91.8	34.3	0.50	A.D.B.
	91.8		34.6	0.50	91.8	34.6	0.50	D.B.
65M x 0	8.2	0.7	21.4	0.68	100.0	33.2	0.51	A.D.B.
	8.2		21.6	0.68	100.0	33.5	0.51	D.B.

SINK-FLOAT ANALYSIS: 1/4" x 65M									
S. G.	WT. %	R.M. %	ASH %	V.M. %	F.C. %	S. %	CUMULATIVE WT. %	CUMULATIVE ASH %	
-1.40	46.7	0.8	5.9	19.4	73.9	0.59	46.7	5.9	A.D.B.
	46.7		5.9	19.6	74.5	0.59	46.7	5.9	D.B.
1.40-1.50	8.0	0.7	18.0	16.8	64.5	0.48	54.7	7.7	A.D.B.
	8.0		18.1	16.9	65.0	0.48	54.7	7.7	D.B.
1.50-1.60	5.3	0.7	29.0				60.0	9.6	A.D.B.
	5.3		29.2				60.0	9.6	D.B.
+1.60	40.0	1.1	69.5				100.0	33.5	A.D.B.
	40.0		70.3				100.0	33.9	D.B.

COMPOSITE 1/4" x 65M FLOATS @ 1.50 S.G., A.D.B.						
F.S.I.	P% ON COAL	DILATATION TEST SOFTENING TEMP. (°C)	MAX. DIL. TEMP. (°C)	MAXIMUM CONTR. %	MAXIMUM DIL. %	G. NO.
7 1/2	.04	407	458	10	3	0.969

Birtley Engineering

Subsidiary of Great West Steel Industries

Lab. No. 8523 Date March 1, 1977

Client: ELCO MINING LTD.

Sample Identification: DH-30-6

Starting Temperature °C: 350

Softening Temperature °C: 407

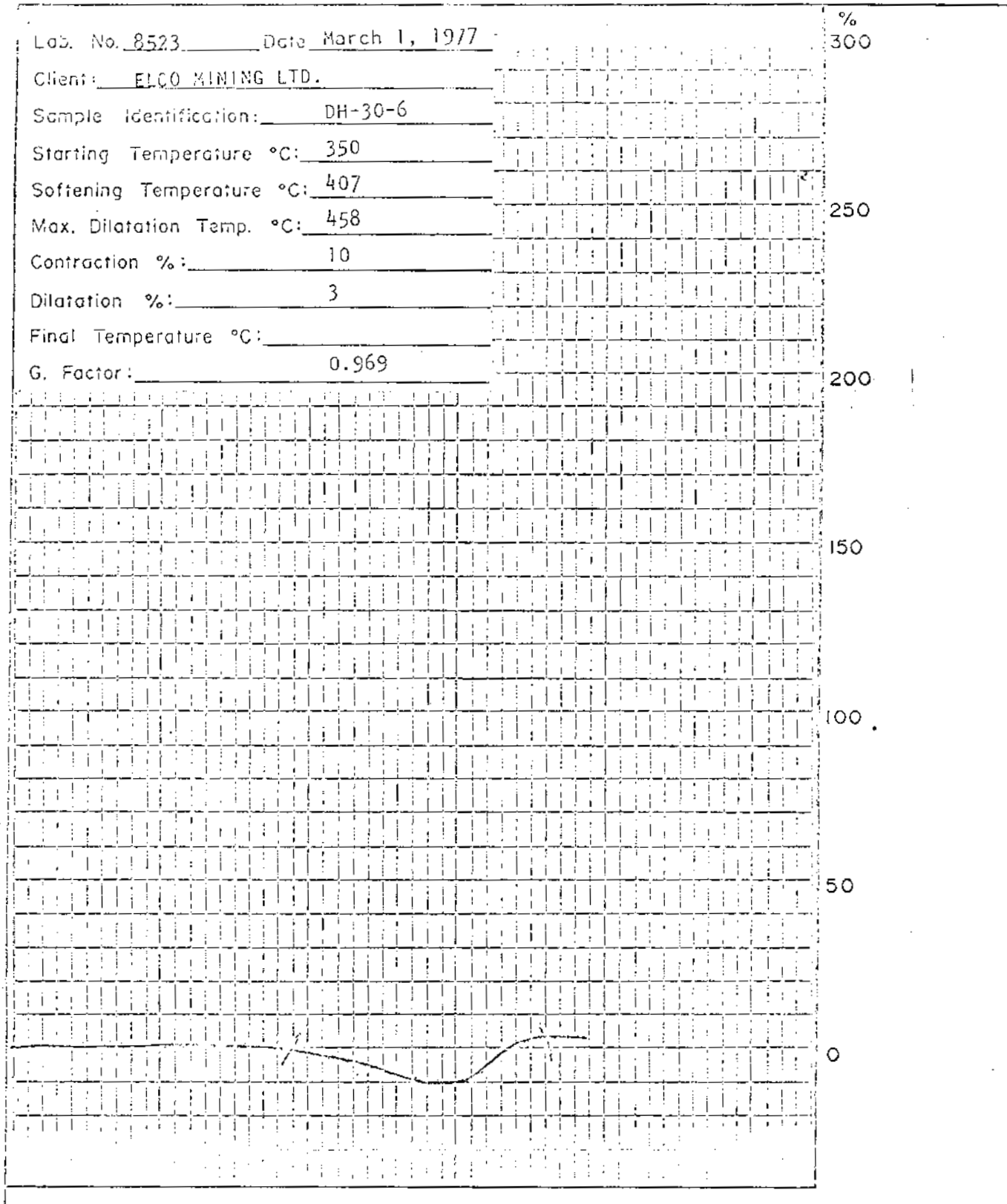
Max. Dilatation Temp. °C: 458

Contraction %: 10

Dilatation %: 3

Final Temperature °C:

G. Factor: 0.969



BIRTLEY ENGINEERING (CANADA) LTD.

Title	Date
RUHR DILATOMETER TEST	
	Drawn

Warnock Hersey Professional Services Ltd.

ELCO MINING LTD. CORE SAMPLE ANALYSIS

Hole No.: DH 30 - 7 Lab. No.: 77 - 3059 Date: March 28, 1977

HEAD RAW ANALYSIS						
R.M.%	Ash%	V.M.%	F.C %	S.%	H.G.I.	REMARKS
0.6	39.6	14.9	44.9	0.41	94.8	Air Dried Basis
- -	39.9	15.0	45.1	0.41	- - -	Dry Basis

SIZE / RAW ANALYSES								
Size Fraction	Wt. %	R.M.%	Ash %	S. %	CUMULATIVE Wt. %	CUMULATIVE Ash %	CUMULATIVE S. %	
¼ x 65	89.2	0.6	41.0	0.39	89.2	41.0	0.39	A.D.B.
	89.2	- -	41.3	0.39	89.2	41.3	0.39	D.B.
65 x 0	10.8	0.5	22.1	0.51	100.0	39.0	0.40	A.D.B.
	10.8	- -	22.2	0.51	100.0	39.2	0.40	D.B.

SINK - FLOAT ANALYSIS: ¼" x 65 M									
S. G.	Wt.%	R.M%	Ash %	V.M%	F.C%	S.%	Cumulative Wt. %	Cumulative Ash %	
-1.40	39.3	1.0	7.0	19.6	72.4	0.49	39.3	7.0	A.D.B.
	39.3	- - -	7.1	19.8	73.1	0.50	39.3	7.1	D.B.
1.40-1.50	7.9	0.8	15.0	18.6	65.6	0.42	47.2	8.3	A.D.B.
	7.9	- -	15.1	18.7	66.2	0.42	47.2	8.4	D.B.
1.50-1.60	6.3	0.8	23.4	- - -	- - -	- - -	53.5	10.1	A.D.B.
	6.3	- -	23.6	- - -	- - -	- - -	53.5	10.2	D.B.
+1.60	46.5	0.9	74.5	- - -	- - -	- - -	100.0	40.0	A.D.B.
	46.5	- -	75.2	- - -	- - -	- -	100.0	40.4	D.B.

COMPOSITE ¼" x 65 m FLOATS @ 1.50 S.G., A.D.B.						
F.S.I.	P % on Coal	DILATATION TESTS Softening Temp. (°C)	Max. Dil. Temp. (°C)	Maximum Contr. %	Maximum Dil. %	G.No.
5½	0.019					

Warnock Hersey Professional Services Ltd.

ELCO MINING LTD. CORE SAMPLE ANALYSIS

Hole No.: DH 30 - 8 Lab. No.: 77 - 3060 Date: March 28, 1977

HEAD RAW ANALYSIS						
R.M.%	Ash%	V.M.%	F.C %	S.%	H.G.I.	REMARKS
0.6	18.5	16.9	64.0	0.57	78.1	Air Dried Basis
- -	18.6	17.0	64.4	0.57	- - -	Dry Basis

SIZE / RAW ANALYSES								
Size Fraction	Wt. %	R.M.%	Ash %	S. %	CUMULATIVE			
					Wt. %	Ash %	S. %	
¼ x 65	92.2	0.4	18.3	0.53	92.2	18.3	0.53	A.D.B.
	92.2	- -	18.4	0.53	92.2	18.4	0.53	D.B.
65 x 0	7.8	0.5	13.7	0.59	100.0	17.9	0.53	A.D.B.
	7.8	- -	13.8	0.59	100.0	18.0	0.53	D.B.

SINK - FLOAT ANALYSIS: ¼" x 65 M									
S. G.	Wt.%	R.M%	Ash %	V.M%	F.C%	S.%	Cumulative		
							Wt. %	Ash %	
-1.40	66.0	0.6	7.2	18.3	73.9	0.57	66.0	7.2	A.D.B.
	66.0	- -	7.3	18.4	74.3	0.57	66.0	7.3	D.B.
1.40-1.50	10.0	0.6	13.6	18.2	67.6	0.52	76.0	8.0	A.D.B.
	10.0	- -	13.6	18.3	68.1	0.52	76.0	8.1	D.B.
1.50-1.60	5.1	0.5	19.7	- -	- -	- -	81.1	8.7	A.D.B.
	5.1	- -	19.8	- -	- -	- -	81.1	8.8	D.B.
+1.60	18.9	0.6	59.2	- -	- -	- -	100.0	18.3	A.D.B.
	18.9	- -	59.6	- -	- -	- -	100.0	18.4	D.B.

COMPOSITE ¼" x 65 m FLOATS @ 1.50 S.G., A.D.B.							
F.S.I.	P % on Coal	DILATATION TESTS					
		Softening Temp.(°C)	Max. Dil. Temp.(°C)	Maximum Contr. %	Maximum Dil. %	G.No.	
3	0.019						

Warnock Hersey Professional Services Ltd.

ELCO MINING LTD. CORE SAMPLE ANALYSIS

Hole No.: DH 30 - 9 Lab. No.: 77 - 3061 Date: March 28, 1977

HEAD RAW ANALYSIS						
F.M.%	Ash%	V.M.%	F.C %	S.%	H.G.I.	REMARKS
0.4	17.5	18.0	64.1	0.70	103.1	Air Dried Basis
- -	17.6	18.0	64.4	0.70	- - -	Dry Basis

SIZE / RAW ANALYSES								
Size Fraction	Wt. %	R.M.%	Ash %	S. %	CUMULATIVE			
					Wt. %	Ash %	S. %	
¼ x 65	87.4	0.4	19.6	0.69	87.4	19.6	0.69	A.D.B.
	87.4	- -	19.7	0.69	87.4	19.7	0.69	D.B.
65 x 0	12.6	0.4	10.3	0.78	100.0	18.4	0.70	A.D.B.
	12.6	- -	10.3	0.78	100.0	18.5	0.70	D.B.

SINK - FLOAT ANALYSIS: ¼" x 65 M									
S. G.	Wt.%	R.M%	Ash %	V.M%	F.C%	S.%	Cumulative		
							Wt. %	Ash %	
-1.40	60.0	0.6	6.9	19.8	72.7	0.82	60.0	6.9	A.D.B.
	60.0	- -	6.9	20.0	73.1	0.82	60.0	6.9	D.B.
1.40-1.50	11.5	0.5	13.9	18.8	66.8	0.68	71.5	8.0	A.D.B.
	11.5	- -	14.0	18.9	67.1	0.68	71.5	8.0	D.B.
1.50-1.60	6.0	0.6	19.6	- -	- -	- -	77.5	8.9	A.D.B.
	6.0	- -	19.7	- -	- -	- -	77.5	8.9	D.B.
+1.60	22.5	0.6	54.0	- -	- -	- -	100.0	19.0	A.D.B.
	22.5	- -	54.3	- -	- -	- -	100.0	19.1	D.B.

COMPOSITE ¼" x 65 m FLOATS @ 1.50 S.G., A.D.B.						
F.S.I.	F % on Coal	DILATATION TESTS				
		Softening Temp.(°C)	Max. Dil. Temp.(°C)	Maximum Contr. %	Maximum Dil. %	G.No.
8½	0.006					

Warnock Hersey Professional Services Ltd.

ELCO MINING LTD. CORE SAMPLE ANALYSIS

Hole No.: DH 30 - 10 Lab. No.: 77 - 3062 Date: March 28, 1977

HEAD RAW ANALYSIS						
R.M.%	Ash%	V.M.%	F.C %	S.%	H.G.I.	REMARKS
0.6	26.1	16.0	57.3	0.36	102.4	Air Dried Basis
- -	26.2	16.0	57.8	0.36	- - -	Dry Basis

SIZE / RAW ANALYSES								
Size Fraction	Wt. %	R.M.%	Ash %	S. %	CUMULATIVE Wt. %	CUMULATIVE Ash %	CUMULATIVE S. %	
¼ x 65	88.8	0.5	27.3	0.35	88.8	27.3	0.35	A.D.B.
	88.8	- -	27.4	0.35	88.8	27.4	0.35	D.B.
65 x 0	11.2	0.4	13.7	0.45	100.0	25.8	0.36	A.D.B.
	11.2	--	13.8	0.45	100.0	25.9	0.36	D.B.

SINK - FLOAT ANALYSIS: ¼" x 65 M									
S. G.	Wt.%	R.M%	Ash %	V.M%	F.C%	S.%	Cumulative Wt. %	Cumulative Ash %	
-1.40	54.8	1.1	5.7	19.1	74.1	0.39	54.8	5.7	A.D.B.
	54.8	- -	5.8	19.3	74.9	0.39	54.8	5.8	D.B.
1.40-1.50	10.8	0.9	14.4	18.1	66.6	0.29	65.6	7.1	A.D.B.
	10.8	- -	14.6	18.2	67.2	0.29	65.6	7.2	D.B.
1.50-1.60	5.4	1.0	20.5	- -	- -	- -	71.0	8.1	A.D.B.
	5.4	- -	20.7	- -	- -	- -	71.0	8.2	D.B.
+1.60	29.0	1.1	73.5	- -	- -	- -	100.0	27.1	A.D.B.
	29.0	- -	73.4	- -	- -	- -	100.0	27.2	D.B.

COMPOSITE ¼" x 65 m FLOATS @ 1.50 S.G., A.D.B.						
F.S.I.	F % on Coal	DILATATION TESTS Softening Temp. (°C)	Max. Dil. Temp. (°C)	Maximum Contr. %	Maximum Dil. %	G.No.
3½	0.021					

Warnock Hersey Professional Services Ltd.

ELCO MINING LTD. CORE SAMPLE ANALYSIS

Hole No.: DH 30 – 11 Lab. No.: 77 – 3063 Date: March 28, 1977

HEAD RAW ANALYSIS						
R.M.%	Ash%	V.M.%	F.C.%	S.%	H.G.I.	REMARKS
0.5	21.0	16.6	61.9	0.42	102.4	Air Dried Basis
– –	21.1	16.6	62.3	0.42	– – –	Dry Basis

SIZE / RAW ANALYSES								
Size Fraction	Wt. %	R.M.%	Ash %	S. %	CUMULATIVE			
					Wt. %	Ash %	S. %	
¼ x 65	89.4	0.4	21.3	0.42	89.4	21.3	0.42	A.D.B.
	89.4	– –	21.4	0.42	89.4	21.4	0.42	D.B.
65 x 0	10.6	0.4	12.2	0.49	100.0	20.3	0.43	A.D.B.
	10.6	– –	12.2	0.49	100.0	20.4	0.43	D.B.

SINK – FLOAT ANALYSIS: ¼" x 65 M									
S. G.	Wt.%	R.M%	Ash %	V.M%	F.C%	S.%	Cumulative		
							Wt. %	Ash %	
-1.40	60.0	0.7	6.2	19.0	74.1	0.45	60.0	6.2	A.D.B.
	60.0	– –	6.3	19.2	74.5	0.45	60.0	6.3	D.B.
1.40-1.50	11.6	0.6	13.4	17.9	68.1	0.36	71.6	7.4	A.D.B.
	11.6	– –	13.5	18.0	68.5	0.36	71.6	7.5	D.B.
1.50-1.60	5.3	0.9	20.7	– –	– –	– –	76.9	8.3	A.D.B.
	5.3	– –	20.9	– –	– –	– –	76.9	8.4	D.B.
+1.60	23.1	0.8	64.7	– –	– –	– –	100.0	21.3	A.D.B.
	23.1	– –	65.2	– –	– –	– –	100.0	21.5	D.B.

COMPOSITE ¼" x 65 m FLOATS @ 1.50 S.G., A.D.B.						
F.S.I.	P % on Coal	DILATATION TESTS				
		Softening Temp.(°C)	Max. Dil. Temp.(°C)	Maximum Contr. %	Maximum Dil. %	G.No.
3½	0.009					

Warnock Hersey Professional Services Ltd.

ELCO MINING LTD. CORE SAMPLE ANALYSIS

Hole No.: DH 30 - 12 Lab. No.: 77 - 3064 Date: March 28, 1977

HEAD RAW ANALYSIS						
R.M.%	Ash%	V.M.%	F.C %	S.%	H.G.I.	REMARKS
0.4	11.1	17.8	70.7	0.52	121.1	Air Dried Basis
- -	11.2	17.9	70.9	0.52	- - -	Dry Basis

SIZE / RAW ANALYSES								
Size Fraction	Wt. %	R.M.%	Ash %	S. %	CUMULATIVE			
					Wt. %	Ash %	S. %	
¼ x 65	90.5	0.4	11.4	0.57	90.5	11.4	0.57	A.D.B.
	90.5	- -	11.4	0.57	90.5	11.4	0.57	D.B.
65 x 0	9.5	0.4	9.4	0.56	100.0	11.2	0.57	A.D.B.
	9.5	- -	9.4	0.56	100.0	11.2	0.57	D.B.

SINK - FLOAT ANALYSIS: ¼" x 65 M									
S. G.	Wt.%	R.M%	Ash %	V.M%	F.C%	S.%	Cumulative		
							Wt. %	Ash %	
-1.40	81.6	0.9	4.9	19.8	74.4	0.55	81.6	4.9	A.D.B.
	81.6	- -	4.9	20.0	75.1	0.55	81.6	4.9	D.B.
1.40-1.50	7.9	1.1	11.9	19.3	67.7	0.46	89.5	5.5	A.D.B.
	7.9	- -	12.0	19.5	68.5	0.47	89.5	5.5	D.B.
1.50-1.60	2.3	1.1	18.3	- -	- -	- -	91.8	5.8	A.D.B.
	2.3	- -	18.5	- -	- -	- -	91.8	5.8	D.B.
+1.60	8.2	1.0	66.0	- -	- -	- -	100.0	10.8	A.D.B.
	8.2	- -	66.7	- -	- -	- -	100.0	10.8	D.B.

COMPOSITE ¼" x 65 m FLOATS @ 1.50 S.G., A.D.B.						
F.S.I.	F % on Coal	DILATATION TESTS				
		Softening Temp.(°C)	Max. Dil. Temp.(°C)	Maximum Contr. %	Maximum Dil. %	G.No.
7½	0.060					

Warnock Hersey Professional Services Ltd.

ELCO MINING LTD. CORE SAMPLE ANALYSIS

Hole No.: DH 30 - 13 Lab. No.: 77 - 3065 Date: March 28, 1977

HEAD RAW ANALYSIS						
R.M.%	Ash%	V.M.%	F.C.%	S.%	H.G.I.	REMARKS
0.4	17.9	18.8	62.9	0.61	110.0	Air Dried Basis
- -	17.9	18.9	63.2	0.61	- - -	Dry Basis

SIZE / RAW ANALYSES								
Size Fraction	Wt. %	R.M.%	Ash %	S. %	CUMULATIVE Wt. %	CUMULATIVE Ash %	CUMULATIVE S. %	
¼ x 65	91.1	0.5	18.4	0.62	91.1	18.4	0.62	A.D.B.
	91.1	- -	18.4	0.62	91.1	18.4	0.62	D.B.
65 x 0	8.9	0.4	12.5	0.61	100.0	17.9	0.62	A.D.B.
	8.9	- -	12.6	0.61	100.0	17.9	0.62	D.B.

SINK - FLOAT ANALYSIS: ¼" x 65 M									
S. G.	Wt.%	R.M%	Ash %	V.M%	F.C%	S.%	Cumulative Wt. %	Cumulative Ash %	
-1.40	54.9	0.7	6.0	20.9	72.4	0.54	54.9	6.0	A.D.B.
	54.9	- -	6.0	21.1	72.9	0.54	54.9	6.0	D.B.
1.40-1.50	18.1	0.8	15.6	19.1	64.5	0.43	73.0	8.4	A.D.B.
	18.1	- -	15.7	19.3	65.0	0.43	73.0	8.4	D.B.
1.50-1.60	8.3	0.9	23.9	- -	- -	- -	81.3	10.0	A.D.B.
	8.3	- -	24.2	- -	- -	- -	81.3	10.0	D.B.
+1.60	18.7	0.9	55.4	- -	- -	- -	100.0	18.5	A.D.B.
	18.7	- -	55.9	- -	- -	- -	100.0	18.6	D.B.

COMPOSITE ¼" x 65 m FLOATS @ 1.50 S.G., A.D.B.						
F.S.I.	P % on Coal	DILATATION TESTS Softening Temp.(°C)	Max. Dil. Temp.(°C)	Maximum Contr. %	Maximum Dil. %	G.No.
9	0.006					

CLIENT: WARNOCK HERSEY

PROJECT: DILATATION TESTS *

SAMPLE : -8 Mesh, 1.50 S.G. Float Composite

DATE: March 30, 1977

Well No.	W.H. I.D. No.	INITIAL TEMP(°C)	SOFTENING TEMP(°C)	MAX. DILAT'N TEMP(°C)	MAX. CONTRACT'N %	MAX. DILATATION %	G.No.
DH 30-7	77-3059	320	421	---	21% @ 464°	---	---
DH 30-8	77-3060	320	424	---	13% @ 471°	---	---
DH 30-9	77-3061	320	414	486	26	12	0.971
DH 30-10	77-3062	320	424	---	15% @ 468°	---	---
DH 30-11	77-3063	320	424	---	15% @ 443°	---	---
DH 30-12	77-3064	320	410	482	30	6	0.949
DH 30-13	77-3065	320	396	475	27	63	1.038
DH 133-1	77-3066	320	370	457	25	149	1.081
DH 133-2	77-3067	320	370	453	28	221	1.085
DH 133-8	77-3068	320	424	471	25	105	1.033

* Softening Temp., Maximum Dilatation/Contraction Temp. are corrected with factor = 6/5

Warnock Hersey Professional Services Ltd.

ELCO MINING LTD.. Elk River Coal Project 1976-77

DRILL CORE ANALYSIS

Sample Identification: DH 31 - 1 Warnock Hersey Lab. No.: 76 - 1255

TABLE I Raw Coal Head Sample ¼" x 0

AIR DRIED BASIS						% DRY BASIS			
Moist.	Ash	V.M.	F. C.	Sulphur	H.G.I.	Ash	V. M.	F.C.	Sulphur
0.7	21.3	22.6	55.4	0.83	117.0	21.4	22.8	55.8	0.84

TABLE II Screen Analysis

	AIR DRIED BASIS				DRY BASIS	
Size	Weight %	Moisture	ASH	Sulphur	ASH	Sulphur
¼" x 65	77.6	0.6	23.2	0.77	23.3	0.78
65 x 0	22.4	0.7	13.9	0.74	14.0	0.75
TOTAL	100.0	--	--	--	21.2	0.77

TABLE III Float/Sink ¼" x 65 Fraction

Spec. Grav.		AIR DRIED BASIS						DRY BASIS			
Sink	Float	Weight%	Moist.	Ash	V.M.	F.C.	Sulphur	ASH	V.M.	F.C.	Sulphur
	1.40	61.8	0.7	6.0	25.5	67.8	0.99	6.0	25.7	68.3	1.00
1.40	1.50	6.4	0.7	13.2	21.8	64.3	0.79	13.3	22.0	64.7	0.80
1.50	1.60	5.1	0.6	24.8	20.4	54.2	0.61	24.9	20.6	54.5	0.61
1.60		26.7	--	--	--	--	--	63.1	--	--	--
TOTAL		100.0	--	--	--	--	--	22.7	--	--	--

TABLE IV Cumulative 1.60 Float

F.S.I.	Phosphorus (in coal)	DILATATION					
		TEMPERATURE °C			PER CENT		"G" FACTOR
		Initial	Softening	Maximum Dilatation	Maximum Contraction	Maximum Dilatation	
8	0.054						

Lab. No. 8130 Date Jan. 25/77

Client: Warnock Hersey

Sample Identification: 76-1255

Starting Temperature °C: 350

Softening Temperature °C: 371

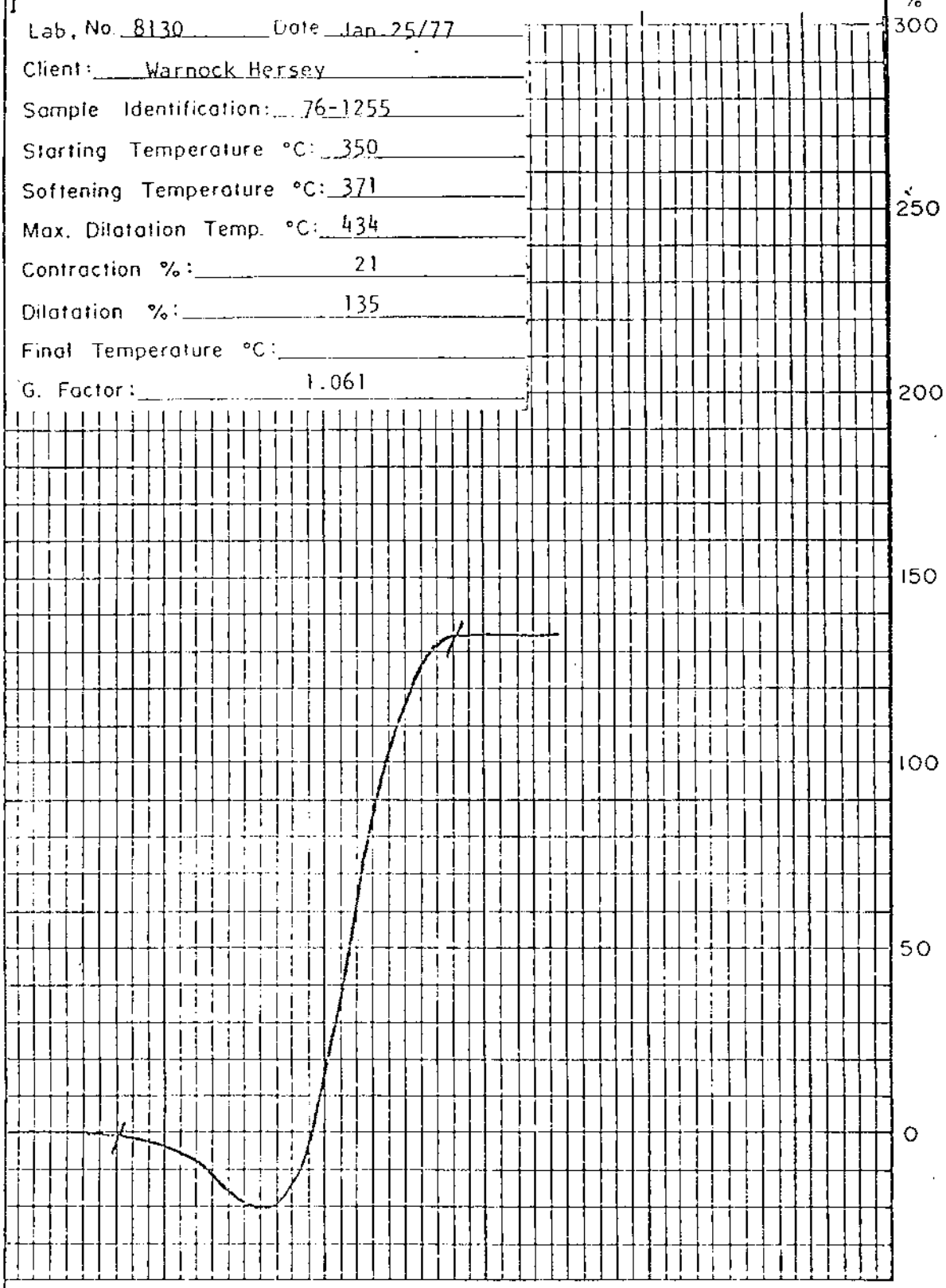
Max. Dilatation Temp. °C: 434

Contraction %: 21

Dilatation %: 135

Final Temperature °C:

G. Factor: 1.061



BIRTLEY ENGINEERING (CANADA) LTD.

Title	Date
RUHR DILATOMETER TEST	
	Drawn

Warnock Hersey Professional Services Ltd.

ELCO MINING LTD.. Elk River Coal Project 1976-77

DRILL CORE ANALYSIS

Sample Identification: DH 31 - 2 Warnock Hersey Lab. No.: 76 - 1256

TABLE I Raw Coal Head Sample ¼" x 0

AIR DRIED BASIS						% DRY BASIS			
Moist.	Ash	V.M.	F.C.	Sulphur	H.G.I.	Ash	V.M.	F.C.	Sulphur
0.6	13.3	22.4	63.7	0.84	110.0	13.4	22.6	64.0	0.84

TABLE II Screen Analysis

	AIR DRIED BASIS				DRY BASIS	
Size	Weight %	Moisture	ASH	Sulphur	ASH	Sulphur
¼" x 65	77.8	0.6	13.8	0.79	13.9	0.80
65 x 0	22.2	0.7	7.5	0.91	7.5	0.92
TOTAL	100.0	--	--	--	12.5	0.83

TABLE III Float/Sink ¼" x 65 Fraction

Spec. Grav.		AIR DRIED BASIS						DRY BASIS			
Sink	Float	Weight%	Moist.	Ash	V.M.	F.C.	Sulphur	ASH	V.M.	F.C.	Sulphur
	1.40	75.7	0.8	7.3	23.2	68.7	0.88	7.3	23.3	69.4	0.89
1.40	1.50	10.2	0.8	16.6	20.2	62.4	0.69	16.8	20.3	62.9	0.70
1.50	1.60	5.7	0.6	25.7	19.5	54.2	0.57	25.9	19.6	54.5	0.57
1.60		8.4	--	--	--	--	--	49.9	--	--	--
TOTAL		100.0	--	--	--	--	--	12.9	--	--	--

TABLE IV Cumulative 1.60 Float

F.S.I.	Phosphorus (in coal)	DILATATION					
		TEMPERATURE °C			PER CENT		"G" FACTOR
		Initial	Softening	Maximum Dilatation	Maximum Contraction	Maximum Dilatation	
6.5	0.025						

II

Lab. No. 8131 Date Jan. 25/77

Client: Warnock Hersey

Sample Identification: 76-1256

Starting Temperature °C: 350

Softening Temperature °C: 383

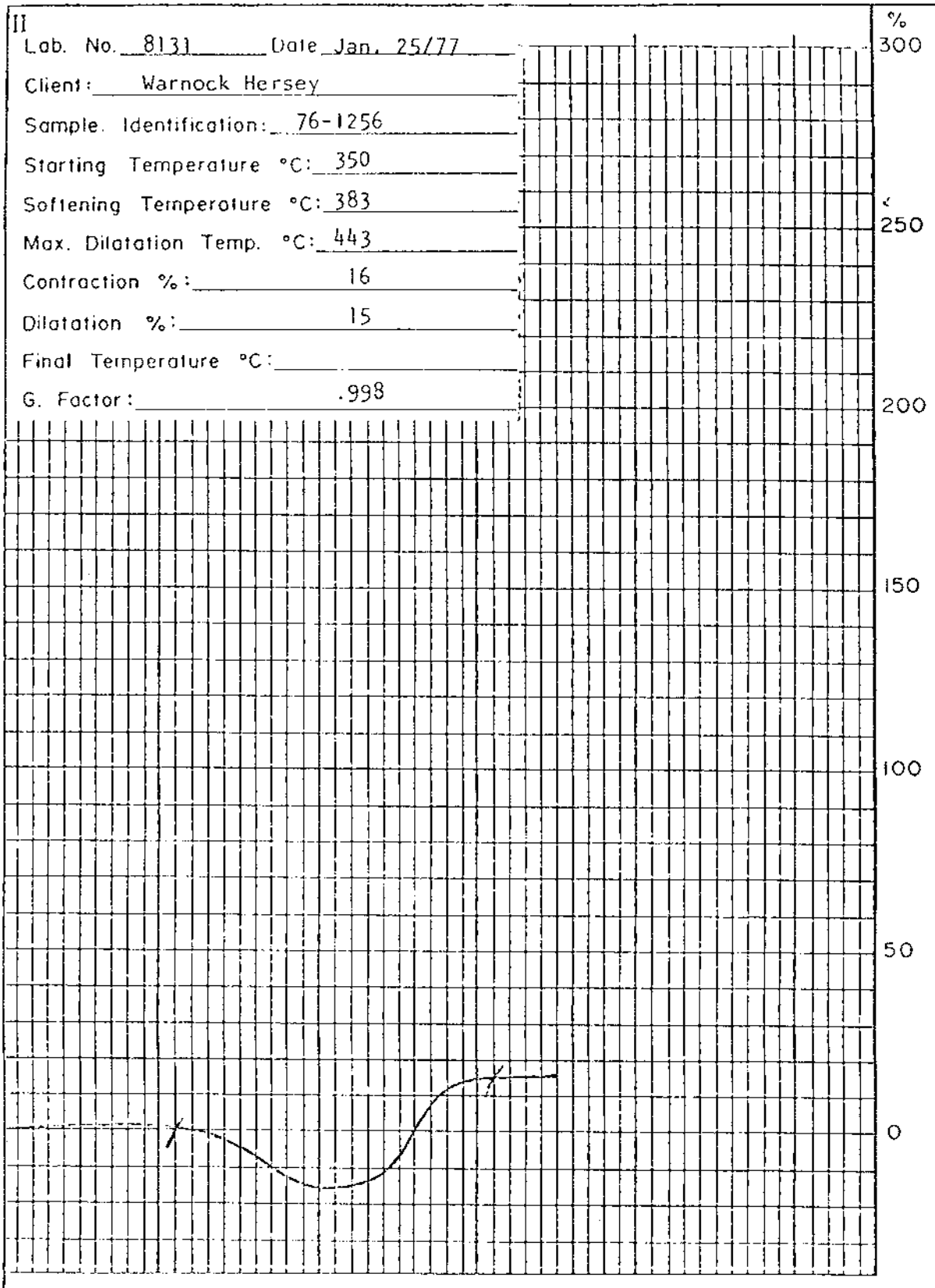
Max. Dilatation Temp. °C: 443

Contraction %: 16

Dilatation %: 15

Final Temperature °C:

G. Factor: .998



BIRTLEY ENGINEERING (CANADA) LTD.

Title	Date
RUHR DILATOMETER TEST	
	Drawn

Warnock Hersey Professional Services Ltd.

ELCO MINING LTD.. Elk River Coal Project 1976-77

DRILL CORE ANALYSIS

Sample Identification: DH 31 - 3 Warnock Hersey Lab. No.: 76 - 1257

TABLE I Raw Coal Head Sample ¼" x 0

AIR DRIED BASIS						% DRY BASIS			
Moist.	Ash	V.M.	F.C.	Sulphur	H.G.I.	Ash	V.M.	F.C.	Sulphur
0.6	38.3	19.8	41.3	1.40	92.7	38.6	19.9	41.5	1.41

TABLE II Screen Analysis

	AIR DRIED BASIS				DRY BASIS	
Size	Weight %	Moisture	ASH	Sulphur	ASH	Sulphur
¼" x 65	80.1	0.5	41.6	1.38	41.8	1.39
65 x 0	19.9	0.6	22.3	1.47	22.4	1.48
TOTAL	100.0	--	--	--	37.9	1.41

TABLE III Float/Sink ¼" x 65 Fraction

Spec. Grav.		AIR DRIED BASIS						DRY BASIS			
Sink	Float	Weight%	Moist.	Ash	V.M.	F.C.	Sulphur	ASH	V.M.	F.C.	Sulphur
	1.40	25.8	0.7	6.2	24.4	68.7	1.25	6.2	24.6	69.2	1.26
1.40	1.50	5.6	0.8	19.6	20.8	58.8	1.07	19.7	20.9	59.4	1.08
1.50	1.60	7.8	0.5	29.9	19.4	50.2	0.89	30.0	19.5	50.5	0.89
1.60		60.8	--	--	--	--	--	66.2	--	--	--
TOTAL		100.0	--	--	--	--	--	45.3	--	--	--

TABLE IV Cumulative 1.60 Float

F.S.I.	Phosphorus (in coal)	DILATATION					
		TEMPERATURE °C			PER CENT		"G" FACTOR
		Initial	Softening	Maximum Dilatation	Maximum Contraction	Maximum Dilatation	
8	0.023						

Lab. No. 8132 Date Jan. 25/77

Client: Warnock Hersey

Sample Identification: 76-1257

Starting Temperature °C: 350

Softening Temperature °C: 380

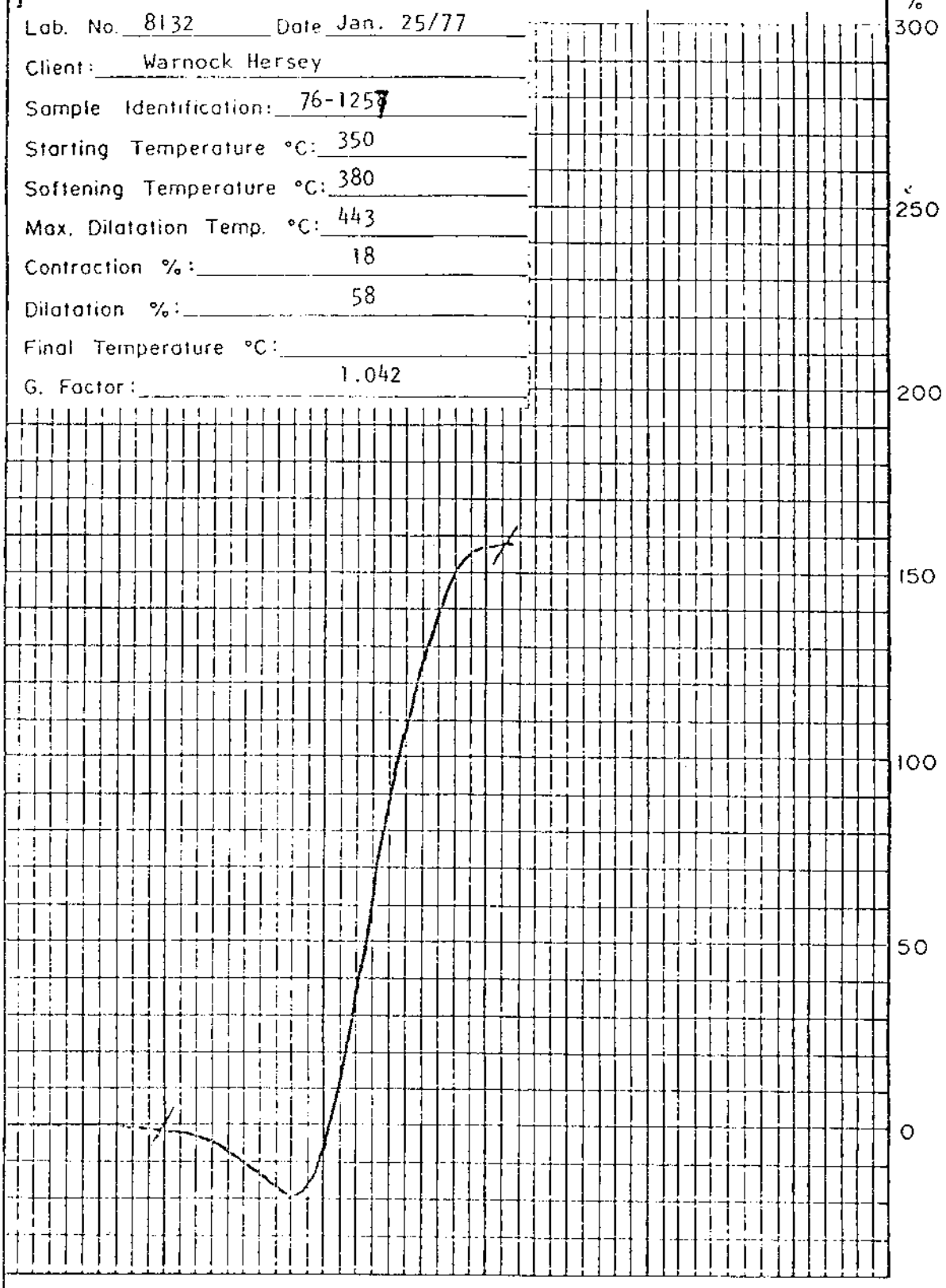
Max. Dilatation Temp. °C: 443

Contraction %: 18

Dilatation %: 58

Final Temperature °C:

G. Factor: 1.042



BIRTLEY ENGINEERING (CANADA) LTD.

Title	Date
RUHR DILATOMETER TEST	
	Drawn

Warnock Hersey Professional Services Ltd.

ELCO MINING LTD.. Elk River Coal Project 1976-77

DRILL CORE ANALYSIS

Sample Identification: DH 31 - 4 Warnock Hersey Lab. No.: 76 - 1258

TABLE I Raw Coal Head Sample ¼" x 0

AIR DRIED BASIS						% DRY BASIS			
Moist.	Ash	V.M.	F. C.	Sulphur	H.G.I.	Ash	V. M.	F.C.	Sulphur
0.7	24.2	21.4	53.7	0.76	108.6	24.4	21.6	54.0	0.77

TABLE II Screen Analysis

	AIR DRIED BASIS				DRY BASIS	
Size	Weight %	Moisture	ASH	Sulphur	ASH	Sulphur
¼" x 65	79.1	0.6	26.3	0.69	26.4	0.69
65 x 0	20.9	0.7	14.0	0.72	14.1	0.72
TOTAL	100.0	--	--	--	23.8	0.70

TABLE III Float/Sink ¼" x 65 Fraction

Spec. Grav.		AIR DRIED BASIS						DRY BASIS			
Sink	Float	Weight%	Moist.	Ash	V.M.	F.C.	Sulphur	ASH	V.M.	F C.	Sulphur
	1.40	61.7	0.7	5.2	26.0	68.1	0.89	5.2	26.2	68.6	0.90
1.40	1.50	5.6	0.7	14.9	20.8	63.6	0.67	15.0	20.9	64.1	0.68
1.50	1.60	3.4	0.6	28.1	19.1	52.2	0.72	28.3	19.3	52.4	0.72
1.60		29.3	--	--	--	--	--	74.1	--	--	--
TOTAL		100.0	--	--	--	--	--	26.7	--	--	--

TABLE IV Cumulative 1.60 Float

F.S.I.	Phosphorus (in coal)	DILATATION					
		TEMPERATURE °C			PER CENT		"C" FACTOR
		Initial	Softening	Maximum Dilatation	Maximum Contraction	Maximum Dilatation	
8	0.018						

Lab. No. 8133 Date Jan. 25/77

Client: Warnock Hersey

Sample Identification: 76-1258

Starting Temperature °C: 350

Softening Temperature °C: 389

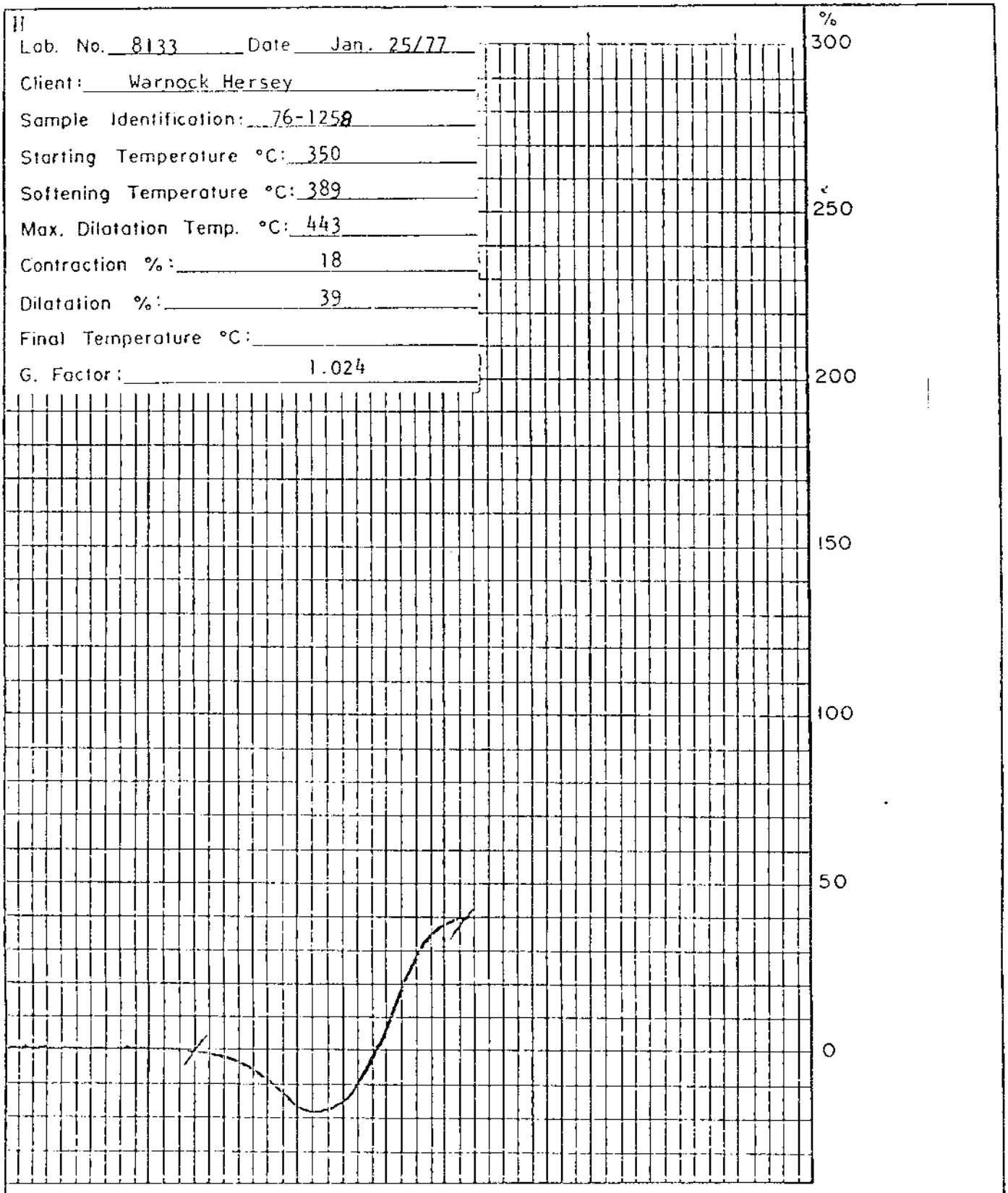
Max. Dilatation Temp. °C: 443

Contraction %: 18

Dilatation %: 39

Final Temperature °C:

G. Factor: 1.024



BIRTLEY ENGINEERING (CANADA) LTD.

Title	Date
RUHR DILATOMETER TEST	
	Drawn

Warnock Hersey Professional Services Ltd.

ELCO MINING LTD.. Elk River Coal Project 1976-77

DRILL CORE ANALYSIS

Sample Identification: DH 31 - 5 Warnock Hersey Lab. No.: 76 - 1259

TABLE I Raw Coal Head Sample ¼" x 0

AIR DRIED BASIS						% DRY BASIS			
Moist.	Ash	V.M.	F.C.	Sulphur	H.G.I.	Ash	V.M.	F.C.	Sulphur
0.7	17.4	20.4	61.5	0.45	98.2	17.5	20.6	61.9	0.45

TABLE II Screen Analysis

	AIR DRIED BASIS				DRY BASIS	
Size	Weight %	Moisture	ASH	Sulphur	ASH	Sulphur
¼" x 65	83.0	0.5	17.7	0.42	17.8	0.42
65 x 0	17.0	0.7	12.7	0.43	12.8	0.43
TOTAL	100.0	--	--	--	17.0	0.42

TABLE III Float/Sink ¼" x 65 Fraction

Spec. Grav.		AIR DRIED BASIS						DRY BASIS			
Sink	Float	Weight%	Moist.	Ash	V.M.	F.C.	Sulphur	ASH	V.M.	F.C.	Sulphur
	1.40	74.1	0.5	5.1	22.6	71.8	0.41	5.1	22.7	72.2	0.41
1.40	1.50	6.8	0.6	13.7	19.8	65.9	0.36	13.8	19.9	66.3	0.36
1.50	1.60	3.3	0.6	23.4	18.9	57.1	0.41	23.5	19.0	57.5	0.41
1.60		15.8	--	--	--	--	--	71.7	--	--	--
TOTAL		100.0	--	--	--	--	--	16.8	--	--	--

TABLE IV Cumulative 1.60 Float

F.S.I.	Phosphorus (in coal)	DILATATION					
		TEMPERATURE °C			PER CENT		"G" FACTOR
		Initial	Softening	Maximum Dilatation	Maximum Contraction	Maximum Dilatation	
6.5	0.011						

I

Lab. No. 8134 Date Jan. 25/88

Client: Warnock Hersey

Sample Identification: 76-1259

Starting Temperature °C: 350

Softening Temperature °C: 395

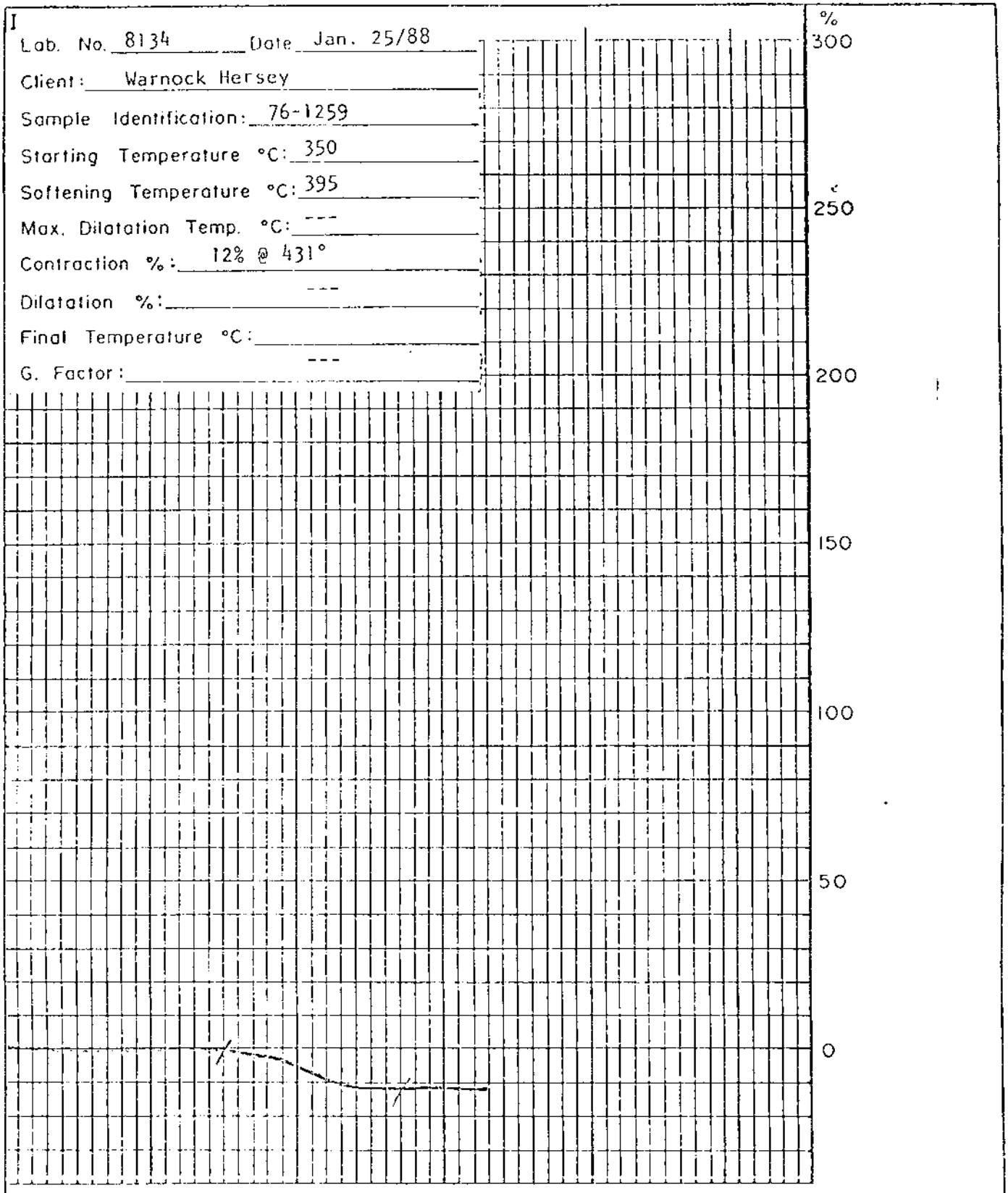
Max. Dilatation Temp. °C: ---

Contraction %: 12% @ 431°

Dilatation %: ---

Final Temperature °C: ---

G. Factor: ---



BIRTLEY ENGINEERING (CANADA) LTD.

Title	Date
RUHR DILATOMETER TEST	
	Drawn

Warnock Hersey Professional Services Ltd.

ELCO MINING LTD.. Elk River Coal Project 1976-77

DRILL CORE ANALYSIS

Sample Identification: DH 31 - 6 Warnock Hersey Lab. No.: 76 - 1260

TABLE I Raw Coal Head Sample ¼" x 0

AIR DRIED BASIS						% DRY BASIS			
Moist.	Ash	V.M.	F. C.	Sulphur	H.G.I.	Ash	V. M.	F.C.	Sulphur
0.6	17.9	19.4	62.1	0.46	90.6	18.0	19.5	62.5	0.46

TABLE II Screen Analysis

	AIR DRIED BASIS				DRY BASIS	
Size	Weight %	Moisture	ASH	Sulphur	ASH	Sulphur
¼" x 65	83.9	0.5	19.8	0.40	19.9	0.40
65 x 0	16.1	0.6	12.7	0.44	12.8	0.44
TOTAL	100.0	--	--	--	18.8	0.41

TABLE III Float/Sink ¼" x 65 Fraction

Spec. Grav.		AIR DRIED BASIS						DRY BASIS			
Sink	Float	Weight%	Moist.	Ash	V.M.	F.C.	Sulphur	ASH	V.M.	F C.	Sulphur
	1.40	64.3	0.5	5.6	19.9	74.0	0.45	5.6	20.0	74.4	0.45
1.40	1.50	10.9	0.5	15.6	18.4	65.5	0.41	15.6	18.5	65.9	0.41
1.50	1.60	4.4	0.5	24.9	17.8	56.8	0.30	25.1	17.9	57.0	0.30
1.60		20.4	--	--	--	--	--	61.3	--	--	--
TOTAL		100.0	--	--	--	--	--	18.9	--	--	--

TABLE IV Cumulative 1.60 Float

F.S.I.	Phosphorus (in coal)	DILATATION					
		TEMPERATURE °C			PER CENT		"G" FACTORS
		Initial	Softening	Maximum Dilatation	Maximum Contraction	Maximum Dilatation	
3.5	0.019						

Lab. No. 8135 Date Jan. 25/77

Client: Warnock Hersey

Sample Identification: 76-1260

Starting Temperature °C: 350

Softening Temperature °C: 401

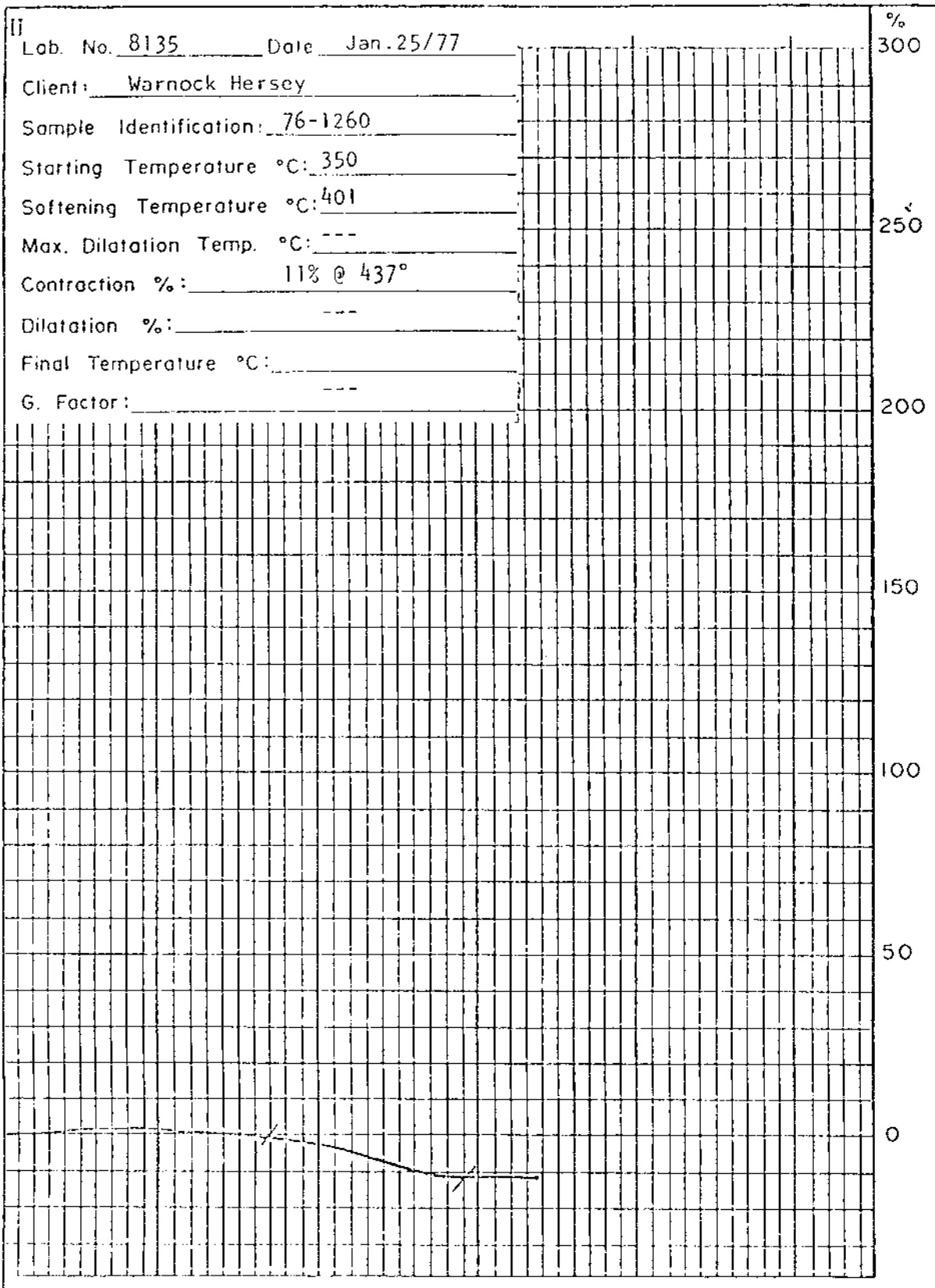
Max. Dilatation Temp. °C: ---

Contraction %: 11% @ 437°

Dilatation %: ---

Final Temperature °C:

G. Factor: ---



BIRTLEY ENGINEERING (CANADA) LTD.

Title	Date
RUHR DILATOMETER TEST	Drawn

Warnock Hersey Professional Services Ltd.

ELCO MINING LTD.. Elk River Coal Project 1976-77

DRILL CORE ANALYSIS

Sample Identification: DH 31 - 7 Warnock Hersey Lab. No.: 76 - 1261

TABLE I Raw Coal Head Sample ¼" x 0

AIR DRIED BASIS						% DRY BASIS			
Moist.	Ash	V.M.	F. C.	Sulphur	H.G. I.	Ash	V. M.	F.C.	Sulphur
0.6	12.5	18.0	68.9	0.61	128.0	12.6	18.1	69.3	0.61

TABLE II Screen Analysis

	AIR DRIED BASIS				DRY BASIS	
Size	Weight %	Moisture	ASH	Sulphur	ASH	Sulphur
¼" x 65	74.2	0.5	12.5	0.58	12.6	0.58
65 x 0	25.8	0.6	6.5	0.65	6.6	0.65
TOTAL	100.0	--	--	--	11.0	0.60

TABLE III Float/Sink ¼" x 65 Fraction

Spec. Grav.		AIR DRIED BASIS						DRY BASIS			
Sink	Float	Weight%	Moist.	Ash	V.M.	F.C.	Sulphur	ASH	V.M.	F.C.	Sulphur
	1.40	71.8	0.6	4.4	22.1	72.9	0.62	4.4	22.3	73.3	0.62
1.40	1.50	13.2	0.8	14.6	18.2	66.4	0.64	14.7	18.3	67.0	0.64
1.50	1.60	5.0	0.7	23.6	17.0	58.7	0.44	23.8	17.1	59.1	0.44
1.60		10.0	--	--	--	--	--	54.8	--	--	--
TOTAL		100.0	--	--	--	--	--	11.8	--	--	--

TABLE IV Cumulative 1.60 Float

F.S.I.	Phosph-orus (in coal)	DILATATION					
		TEMPERATURE °C			PER CENT		"G" FACTOR
		Initial	Softening	Maximum Dilatation	Maximum Contraction	Maximum Dilatation	
5.5	0.034						

Lab No. 8136 Date Jan. 25/77

Client: Warnock Hersey

Sample Identification: 76-1261

Starting Temperature °C: 350

Softening Temperature °C: 407

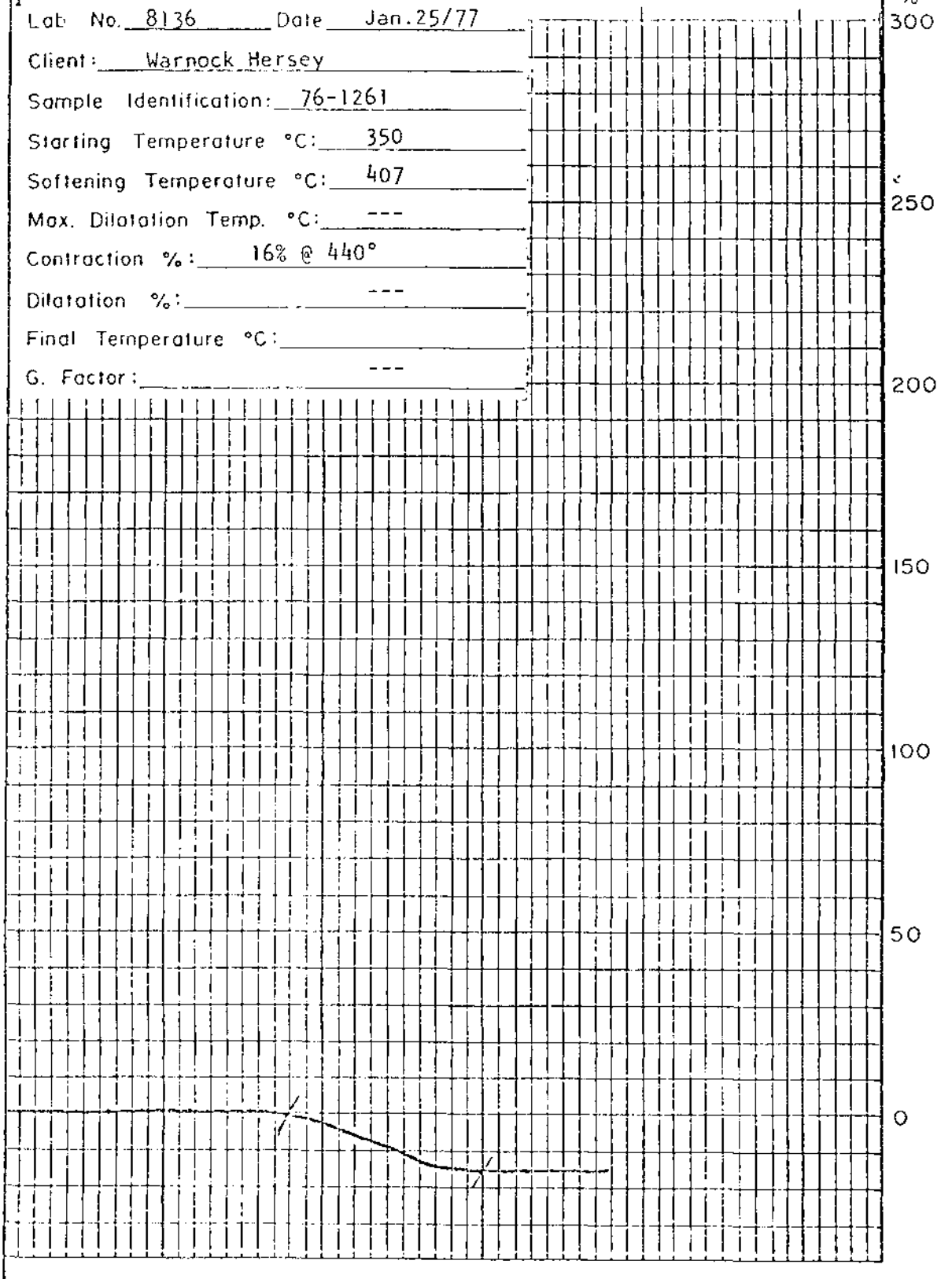
Max. Dilatation Temp. °C: ---

Contraction %: 16% @ 440°

Dilatation %: ---

Final Temperature °C:

G. Factor: ---



BIRTLEY ENGINEERING (CANADA) LTD.

Title	Date
RUHR DILATOMETER TEST	
	Drawn

Warnock Hersey Professional Services Ltd.

ELCO MINING LTD.. Elk River Coal Project 1976-77

DRILL CORE ANALYSIS

Sample Identification: DH 31 - 8 Warnock Hersey Lab. No.: 76 - 1262

TABLE I Raw Coal Head Sample ¼" x 0

AIR DRIED BASIS						% DRY BASIS			
Moist.	Ash	V.M.	F. C.	Sulphur	H.G.I.	Ash	V. M.	F.C.	Sulphur
0.5	15.4	18.7	65.4	0.62	94.1	15.5	18.8	65.7	0.62

TABLE II Screen Analysis

	AIR DRIED BASIS				DRY BASIS	
Size	Weight %	Moisture	ASH	Sulphur	ASH	Sulphur
¼" x 65	83.2	0.4	16.6	0.61	16.6	0.61
65 x 0	16.8	0.6	11.2	0.73	11.3	0.73
TOTAL	100.0	--	--	--	15.7	0.63

TABLE III Float/Sink ¼" x 65 Fraction

Spec. Grav.		AIR DRIED BASIS						DRY BASIS			
Sink	Float	Weight%	Moist.	Ash	V.M.	F.C.	Sulphur	ASH	V.M.	F C.	Sulphur
	1.40	68.3	0.6	6.1	19.5	73.8	0.70	6.1	19.6	74.3	0.70
1.40	1.50	9.9	0.5	16.9	17.8	64.8	0.56	17.0	17.9	65.1	0.56
1.50	1.60	5.3	0.5	26.7	17.1	55.7	0.49	26.8	17.2	56.0	0.49
1.60		16.5	--	--	--	--	--	60.9	--	--	--
TOTAL		100.0	--	--	--	--	--	17.3	--	--	--

TABLE IV Cumulative 1.60 Float

F.S.I.	Phosphorus (in coal)	DILATATION					
		TEMPERATURE °C			PER CENT		"G" FACTOR
		Initial	Softening	Maximum Dilatation	Maximum Contraction	Maximum Dilatation	
6	0.017						

Lab. No. 8137 Date Jan. 25/77

Client: Warnock Hersey

Sample Identification: 76-1262

Starting Temperature °C: 350

Softening Temperature °C: 374

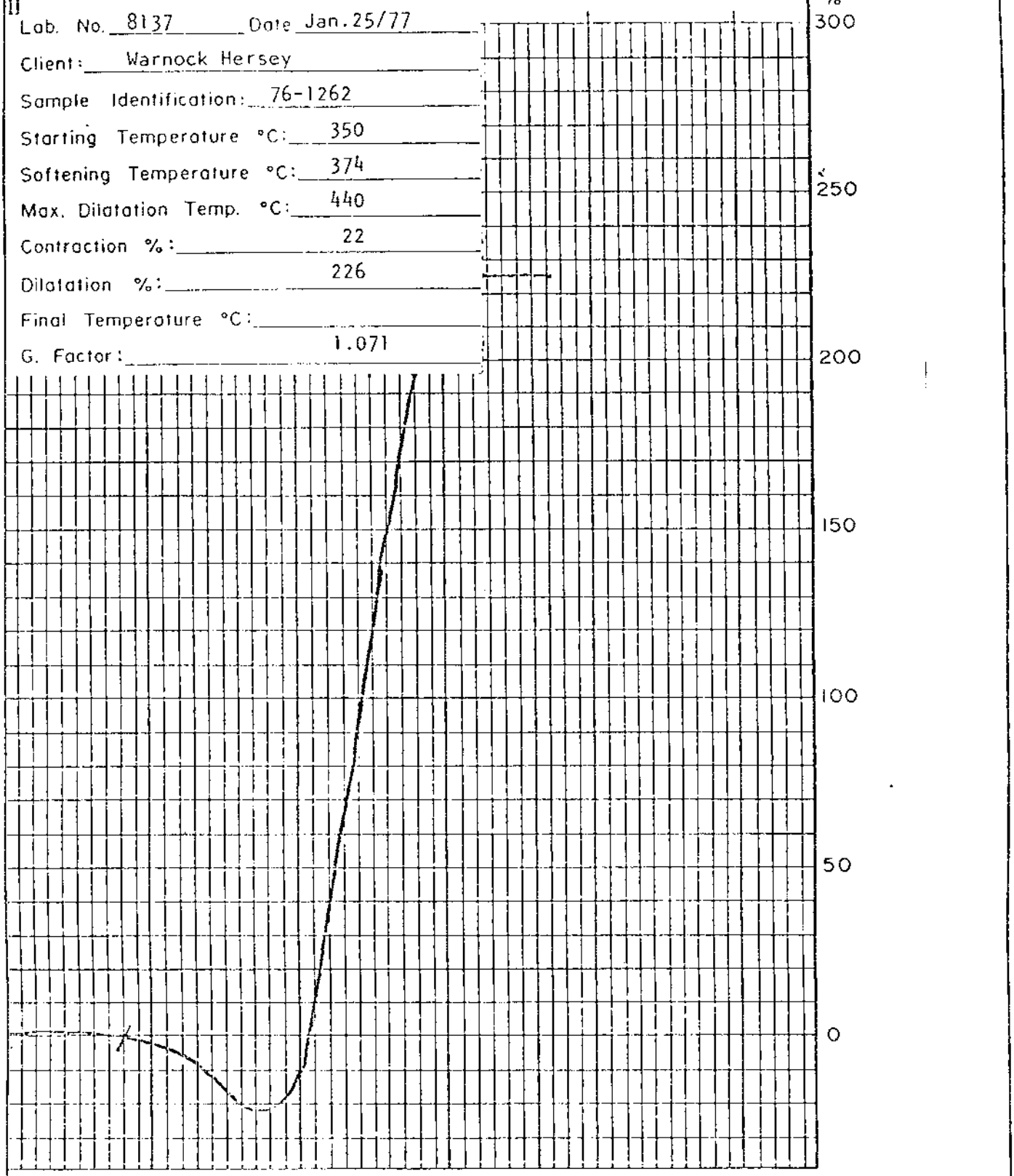
Max. Dilatation Temp. °C: 440

Contraction %: 22

Dilatation %: 226

Final Temperature °C:

G. Factor: 1.071



BIRTLEY ENGINEERING (CANADA) LTD.

Title	Date
RUHR DILATOMETER TEST	
	Drawn

Warnock Hersey Professional Services Ltd.

ELCO MINING LTD.. Elk River Coal Project 1976-77

DRILL CORE ANALYSIS

Sample Identification: DH 32 - 1 Warnock Hersey Lab. No.: 76 - 1263

TABLE I Raw Coal Head Sample ¼" x 0

AIR DRIED BASIS						% DRY BASIS			
Moist.	Ash	V.M.	F.C.	Sulphur	H.G.I.	Ash	V.M.	F.C.	Sulphur
0.7	24.6	20.9	53.8	0.66	83.7	24.7	21.1	54.2	0.66

TABLE II Screen Analysis

	AIR DRIED BASIS				DRY BASIS	
Size	Weight %	Moisture	ASH	Sulphur	ASH	Sulphur
¼" x 65	83.0	0.6	26.5	0.72	26.6	0.72
65 x 0	17.0	0.8	22.4	0.72	22.6	0.72
TOTAL	100.0	--	--	--	25.9	0.72

TABLE III Float/Sink ¼" x 65 Fraction

Spec. Grav.		AIR DRIED BASIS						DRY BASIS			
Sink	Float	Weight%	Moist.	Ash	V.M.	F.C.	Sulphur	ASH	V.M.	F.C.	Sulphur
	1.40	61.0	0.7	4.6	25.3	69.4	0.81	4.6	25.5	69.9	0.82
1.40	1.50	4.5	0.6	16.6	21.7	61.1	0.70	16.7	21.8	61.5	0.70
1.50	1.60	3.1	0.6	25.4	20.5	53.5	0.67	25.5	20.7	53.8	0.67
1.60		31.4	--	--	--	--	--	72.5	--	--	--
TOTAL		100.0	--	--	--	--	--	27.1	--	--	--

TABLE IV Cumulative 1.60 Float

F.S.I.	Precipitate (in coal)	DILATATION					
		TEMPERATURE °C			PERCENT		"G" FACTOR
		Initial	Softening	Maximum Dilatation	Maximum Contraction	Maximum Dilatation	
8	0.018						

Lab. No. 8138 Date Jan. 25/77

Client: Warnock Hersey

Sample Identification: 76-1263

Starting Temperature °C: 350

Softening Temperature °C: 398

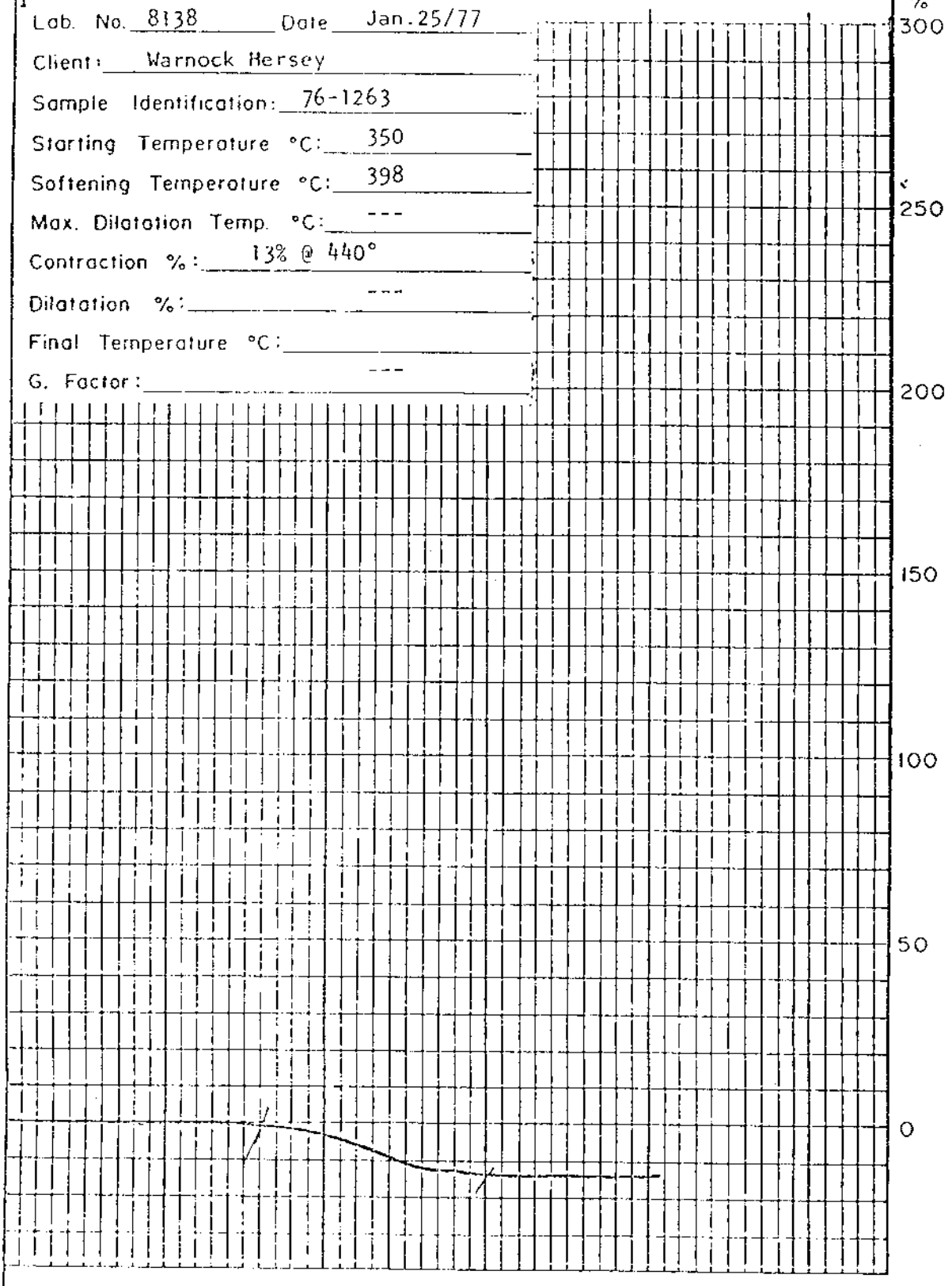
Max. Dilatation Temp. °C: ---

Contraction %: 13% @ 440°

Dilatation %: ---

Final Temperature °C:

G. Factor: ---



BIRTLEY ENGINEERING (CANADA) LTD.

Title	Date
RUHR DILATOMETER TEST	
	Drawn

Warnock Hersey Professional Services Ltd.

ELCO MINING LTD.. Elk River Coal Project 1976-77

DRILL CORE ANALYSIS

Sample Identification: DH 32 - 2 Warnock Hersey Lab. No.: 76 - 1264

TABLE I Raw Coal Head Sample ¼" x 0

AIR DRIED BASIS						% DRY BASIS			
Moist.	Ash	V.M.	F. C.	Sulphur	H.G. I.	Ash	V. M.	F.C.	Sulphur
0.7	54.5	16.5	28.3	0.54	67.1	54.8	16.6	28.6	0.54

TABLE II Screen Analysis

	AIR DRIED BASIS				DRY BASIS	
Size	Weight %	Moisture	ASH	Sulphur	ASH	Sulphur
¼" x 65	81.0	0.6	52.8	0.47	53.1	0.47
65 x 0	19.0	0.7	51.5	0.57	51.9	0.57
TOTAL	100.0	--	--	--	52.9	0.49

TABLE III Float/Sink ¼" x 65 Fraction

Spec. Grav.		AIR DRIED BASIS						DRY BASIS			
Sink	Float	Weight%	Moist.	Ash	V.M.	F.C.	Sulphur	ASH	V.M.	F.C.	Sulphur
	1.40	6.4	0.6	11.7	24.6	63.1	0.55	11.8	24.8	63.4	0.55
1.40	1.50	4.0	0.6	20.0	20.8	58.6	0.60	20.2	20.9	58.9	0.60
1.50	1.60	4.6	0.6	32.9	17.9	48.6	0.56	33.1	18.0	48.9	0.56
1.60		85.0	--	--	--	--	--	63.3	--	--	--
TOTAL		100.0	--	--	--	--	--	56.9	--	--	--

TABLE IV Cumulative 1.60 Float

F.S.I.	Phosphorus (in coal)	DILATATION					
		TEMPERATURE °C			PER CENT		"G" FACTOR
		Initial	Softening	Maximum Dilatation	Maximum Contraction	Maximum Dilatation	
5.5	0.040						

Lab. No. 8139 Date Jan. 25/77

Client: Warnock Hersey

Sample Identification: 76-1264

Starting Temperature °C: 350

Softening Temperature °C: 380

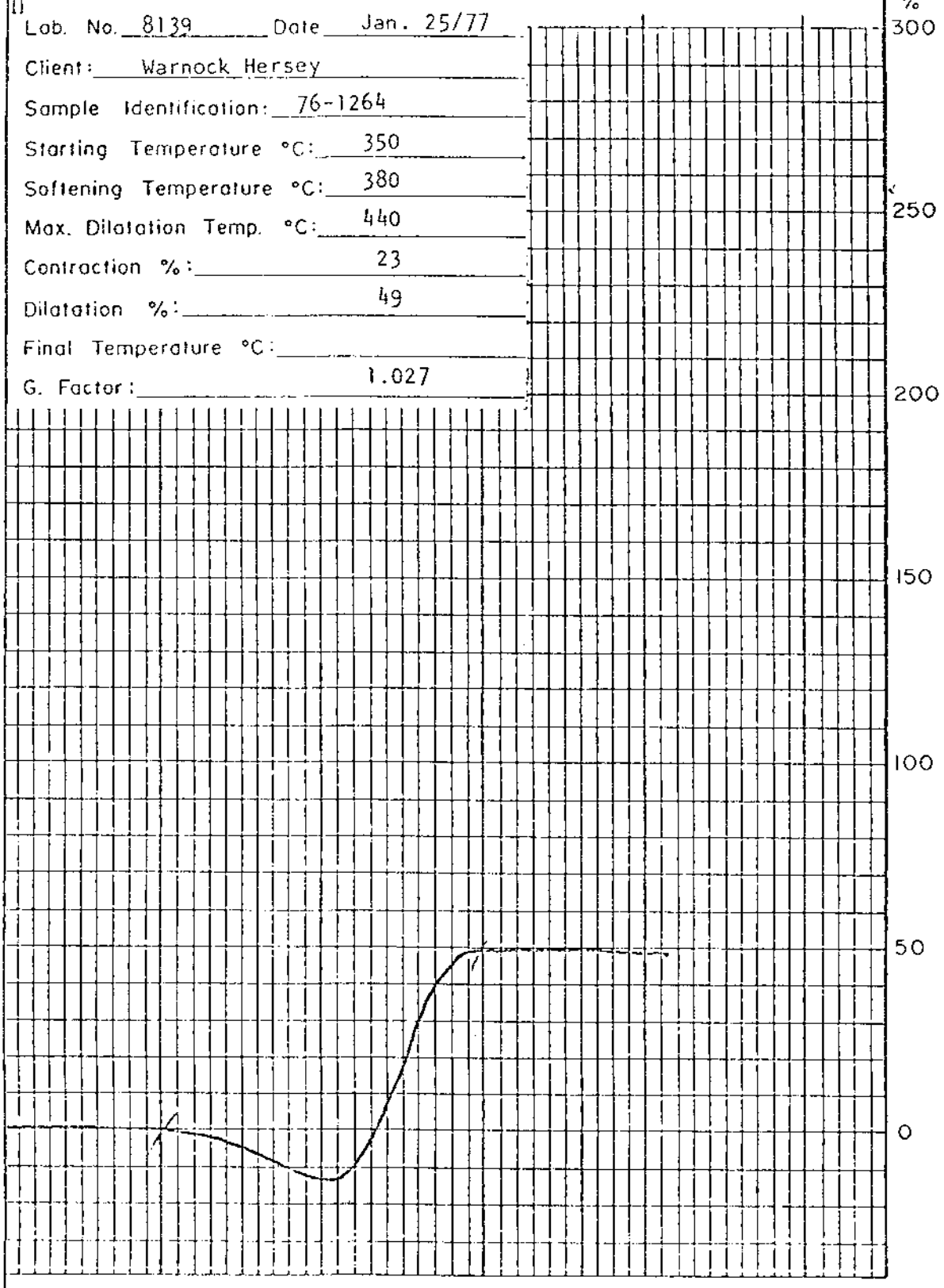
Max. Dilatation Temp. °C: 440

Contraction %: 23

Dilatation %: 49

Final Temperature °C:

G. Factor: 1.027



BIRTLEY ENGINEERING (CANADA) LTD.

Title	Date
RUHR DILATOMETER TEST	
	Drawn

Warnock Hersey Professional Services Ltd.

ELCO MINING LTD.. Elk River Coal Project 1976-77

DRILL CORE ANALYSIS

Sample Identification: DH 32 - 3 Warnock Hersey Lab. No.: 76 - 1265

TABLE I Raw Coal Head Sample ¼" x 0

AIR DRIED BASIS						% DRY BASIS			
Moist.	Ash	V.M.	F. C.	Sulphur	H.G. I.	Ash	V. M.	F.C.	Sulphur
0.7	28.9	21.0	49.4	0.80	100.0	29.1	21.1	49.8	0.81

TABLE II Screen Analysis

	AIR DRIED BASIS				DRY BASIS	
Size	Weight %	Moisture	ASH	Sulphur	ASH	Sulphur
¼" x 65	78.3	0.7	33.2	0.81	33.4	0.82
65 x 0	21.7	0.8	22.4	0.89	22.6	0.90
TOTAL	100.0	--	--	--	31.0	0.84

TABLE III Float/Sink ¼" x 65 Fraction

Spec. Grav.		AIR DRIED BASIS						DRY BASIS			
Sink	Float	Weight%	Moist.	Ash	V.M.	F.C.	Sulphur	ASH	V.M.	F.C.	Sulphur
	1.40	53.9	0.9	5.0	26.6	67.5	0.86	5.0	26.8	68.2	0.87
1.40	1.50	5.9	0.6	19.9	22.2	57.3	0.68	20.0	22.4	57.6	0.68
1.50	1.60	2.9	0.7	28.1	19.9	51.3	0.63	28.3	20.0	51.7	0.63
1.60		37.3	--	--	--	--	--	75.1	--	--	--
TOTAL		100.0	--	--	--	--	--	32.7	--	--	--

TABLE IV Cumulative 1.60 Float

F.S.I.	Phosphorus (in coal)	DILATATION					
		TEMPERATURE °C			PER CENT		"G" FACTOR
		Initial	Softening	Maximum Dilatation	Maximum Contraction	Maximum Dilatation	
7.5	0.023						

Lab. No. 8140 Date Jan. 25/77

Client: Warnock Hersey

Sample Identification: 76-1265

Starting Temperature °C: 350

Softening Temperature °C: 380

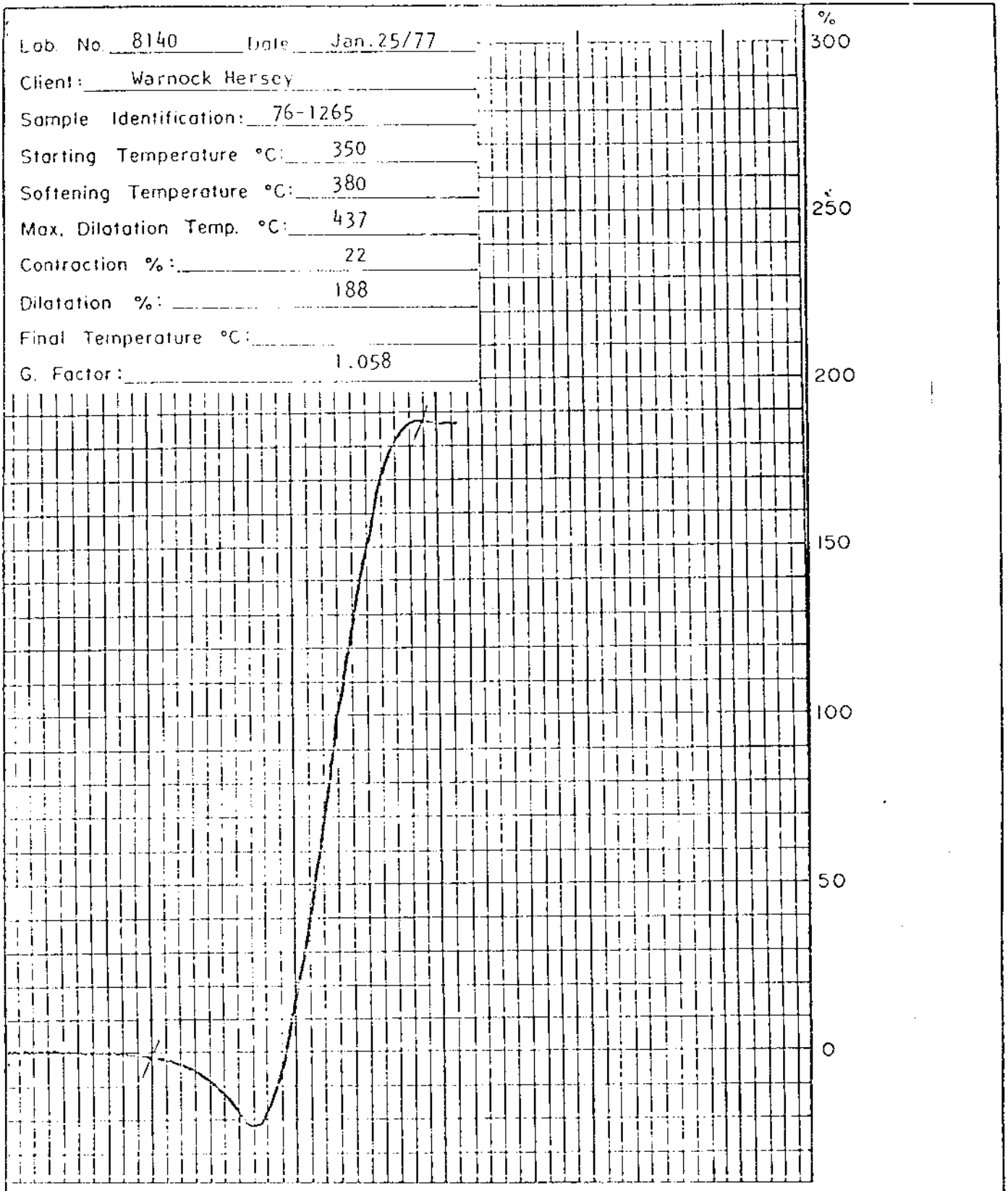
Max. Dilatation Temp. °C: 437

Contraction %: 22

Dilatation %: 188

Final Temperature °C:

G. Factor: 1.058



BIRTLEY ENGINEERING (CANADA) LTD.

Title	Date
RUHR DILATOMETER TEST	
	Drawn

Warnock Hersey Professional Services Ltd.

ELCO MINING LTD.. Elk River Coal Project 1976-77

DRILL CORE ANALYSIS

Sample Identification: DH 32 - 4 Warnock Hersey Lab. No.: 76 - 1266

TABLE I Raw Coal Head Sample ¼" x 0

AIR DRIED BASIS						% DRY BASIS			
Moist.	Ash	V.M.	F. C.	Sulphur	H.G.I.	Ash	V. M.	F.C.	Sulphur
0.7	17.3	23.6	58.4	0.94	158.5	17.4	23.7	58.9	0.95

TABLE II Screen Analysis

	AIR DRIED BASIS				DRY BASIS	
Size	Weight %	Moisture	ASH	Sulphur	ASH	Sulphur
¼" x 65	69.5	0.6	19.1	0.90	19.2	0.90
65 x 0	30.5	0.8	11.8	0.99	11.9	1.00
TOTAL	100.0	--	--	--	17.0	0.93

TABLE III Float/Sink ¼" x 65 Fraction

Spec. Grav.		AIR DRIED BASIS						DRY BASIS			
Sink	Float	Weight%	Moist.	Ash	V.M.	F.C.	Sulphur	ASH	V.M.	F C.	Sulphur
	1.40	74.5	0.8	3.6	26.2	69.4	0.96	3.6	26.4	70.0	.97
1.40	1.50	4.6	0.7	16.8	21.8	60.7	0.80	16.9	22.0	61.1	0.81
1.50	1.60	3.0	0.7	22.8	21.2	55.3	0.73	23.0	21.4	55.6	0.74
1.60		17.9	--	--	--	--	--	75.9	--	--	--
TOTAL		100.0	--	--	--	--	--	17.7	--	--	--

TABLE IV Cumulative 1.60 Float

F.S.I.	Phosphorus (in coal)	DILATATION					
		TEMPERATURE °C			PER CENT		"C" FACTOR
		Initial	Softening	Maximum Dilatation	Maximum Contraction	Maximum Dilatation	
7½	0.015						

Lab. No. 8141 Date Jan. 25/77

Client: Warnock Hersey

Sample Identification: 76-1266

Starting Temperature °C: 350

Softening Temperature °C: ~~883~~ 383

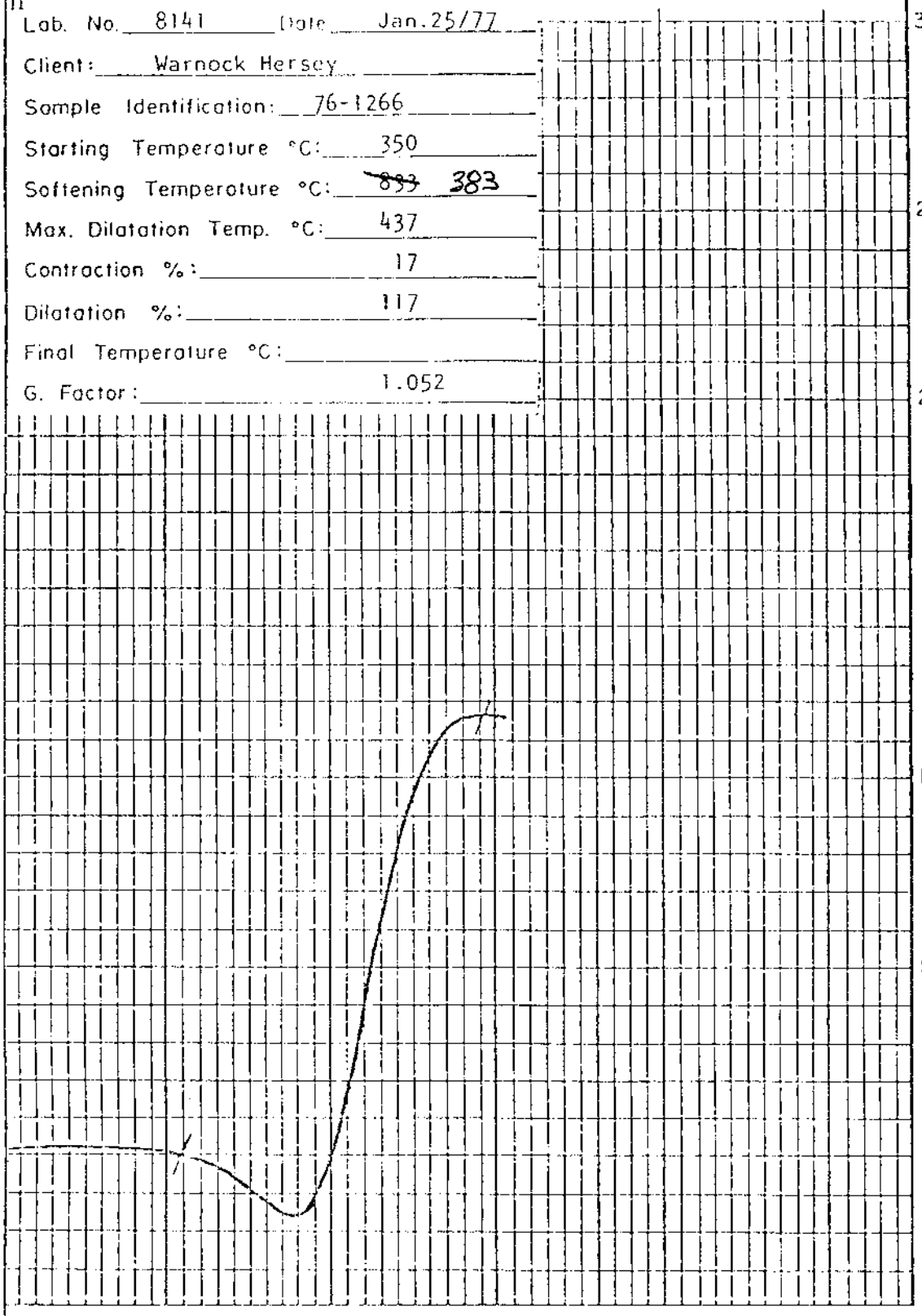
Max. Dilatation Temp. °C: 437

Contraction %: 17

Dilatation %: 117

Final Temperature °C:

G. Factor: 1.052



BIRTLEY ENGINEERING (CANADA) LTD.

Title	Date
RUHR DILATOMETER TEST	
	Drawn

Warnock Hersey Professional Services Ltd.

ELCO MINING LTD.. Elk River Coal Project 1976-77

DRILL CORE ANALYSIS

Sample Identification: DH 32 - 5 Warnock Hersey Lab. No.: 76 - 1267

TABLE I Raw Coal Head Sample ¼" x 0

AIR DRIED BASIS						% DRY BASIS			
Moist.	Ash	V.M.	F.C.	Sulphur	H.G.I.	Ash	V.M.	F.C.	Sulphur
0.7	25.0	20.4	53.9	0.88	93.4	25.1	20.5	54.4	0.89

TABLE II Screen Analysis

	AIR DRIED BASIS				DRY BASIS	
Size	Weight %	Moisture	ASH	Sulphur	ASH	Sulphur
¼" x 65	81.9	0.6	26.5	0.91	26.6	0.92
65 x 0	18.1	0.7	22.7	0.93	22.8	0.94
TOTAL	100.0	--	--	--	25.9	0.92

TABLE III Float/Sink ¼" x 65 Fraction

Spec. Grav.		AIR DRIED BASIS						DRY BASIS			
Sink	Float	Weight%	Moist.	Ash	V.M.	F.C.	Sulphur	ASH	V.M.	F.C.	Sulphur
	1.40	53.5	0.7	6.6	24.3	68.4	0.98	6.6	24.5	68.9	0.99
1.40	1.50	8.3	0.5	19.6	21.2	58.7	0.83	19.7	21.3	59.0	0.83
1.50	1.60	5.0	0.6	26.6	20.6	52.2	0.77	26.7	20.8	52.5	0.78
1.60		33.2	--	--	--	--	--	65.0	--	--	--
TOTAL		100.0	--	--	--	--	--	28.1	--	--	--

TABLE IV Cumulative 1.60 Float

F.S.I.	Phosphorus (in coal)	DILATATION					
		TEMPERATURE °C			PER CENT		"G" FACTOR
		Initial	Softening	Maximum Dilatation	Maximum Contraction	Maximum Dilatation	
8.5	0.016						

Lab. No. 8142 Date Jan. 25/77

Client: Warnock Hersey

Sample Identification: 76-1287

Starting Temperature °C: 350

Softening Temperature °C: 377

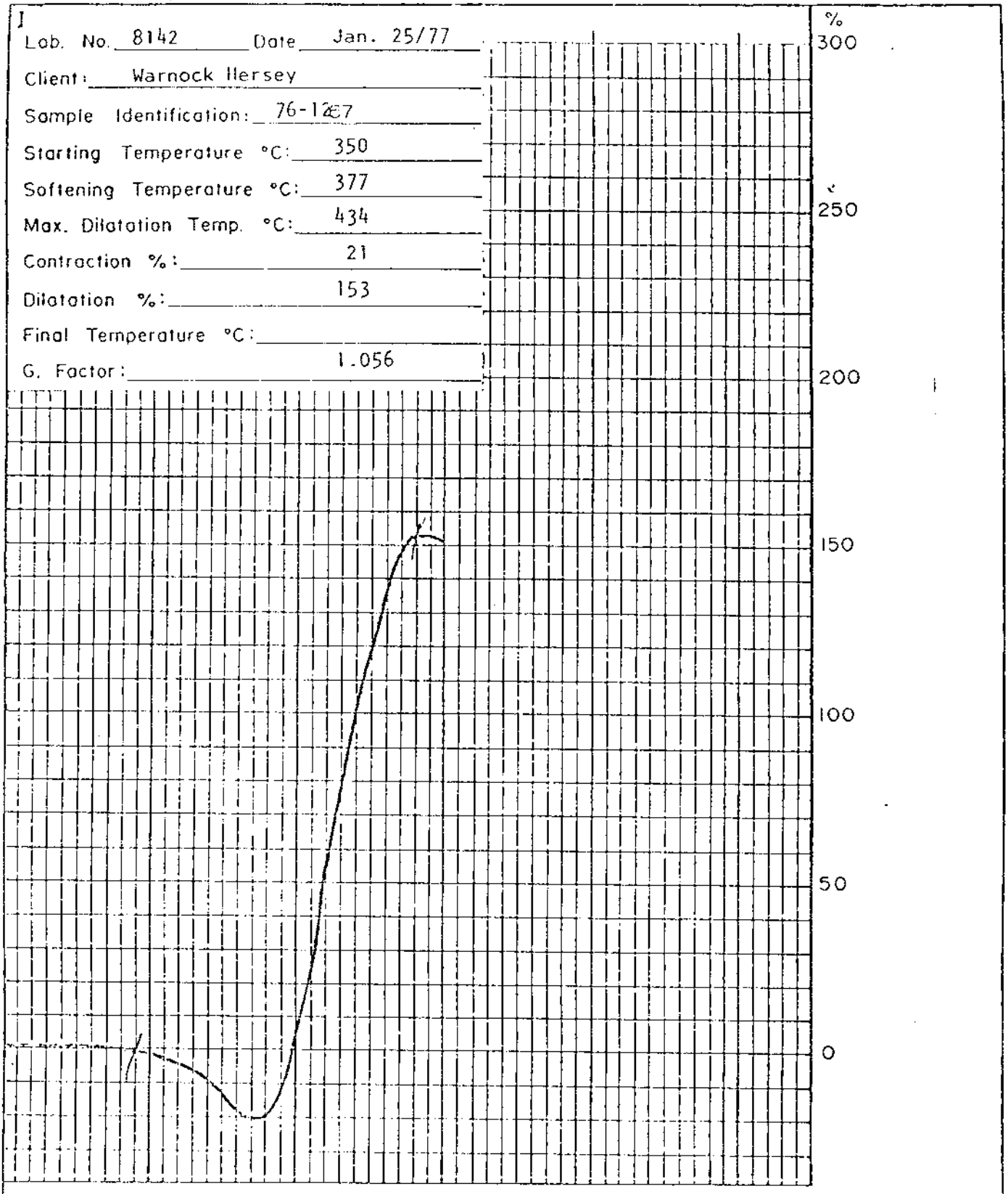
Max. Dilatation Temp. °C: 434

Contraction %: 21

Dilatation %: 153

Final Temperature °C:

G. Factor: 1.056



BIRTLEY ENGINEERING (CANADA) LTD.

Title	Date
RUHR DILATOMETER TEST	
	Drawn

Warnock Hersey Professional Services Ltd.

ELCO MINING LTD. — Elk River Coal Project 1976-77

DRILL CORE ANALYSIS

Sample Identification: DH 32 - 6 — Warnock Hersey Lab. No.: 76 - 1268

TABLE I Raw Coal Head Sample ¼" x 0

AIR DRIED BASIS						% DRY BASIS			
Moist.	Ash	V.M.	F.C.	Sulphur	H.G.I.	Ash	V.M.	F.C.	Sulphur
0.8	42.3	16.8	40.1	0.88	95.5	42.6	17.0	40.4	0.89

TABLE II Screen Analysis

	AIR DRIED BASIS				DRY BASIS	
Size	Weight %	Moisture	ASH	Sulphur	ASH	Sulphur
¼" x 65	74.9	0.8	49.4	0.75	49.8	0.76
65 x 0	25.1	0.8	27.8	0.95	28.0	0.96
TOTAL	100.0	--	--	--	44.3	0.81

TABLE III Float/Sink ¼" x 65 Fraction

Spec. Grav.		AIR DRIED BASIS						DRY BASIS			
Sink	Float	Weight%	Moist.	Ash	V.M.	F.C.	Sulphur	ASH	V.M.	F.C.	Sulphur
	1.40	18.9	0.8	6.2	24.5	68.5	0.95	6.3	24.7	69.0	0.96
1.40	1.50	9.2	0.7	13.7	21.6	64.0	0.87	13.8	21.8	64.4	0.88
1.50	1.60	4.8	0.8	26.7	19.3	53.2	0.80	26.9	19.5	53.6	0.81
1.60		67.1	--	--	--	--	--	73.4	--	--	--
TOTAL		100.0	--	--	--	--	--	49.2	--	--	--

TABLE IV Cumulative 1.60 Float

F.S.I.	Phosphorus (in coal)	DILATATION					
		TEMPERATURE °C			PER CENT		"G" FACTOR
		Initial	Softening	Maximum Dilatation	Maximum Contraction	Maximum Dilatation	
7.5	0.026						

Lab. No. 8143 Date Jan. 25/77

Client: Warnock Hersey

Sample Identification: 76-1268

Starting Temperature °C: 350

Softening Temperature °C: 380

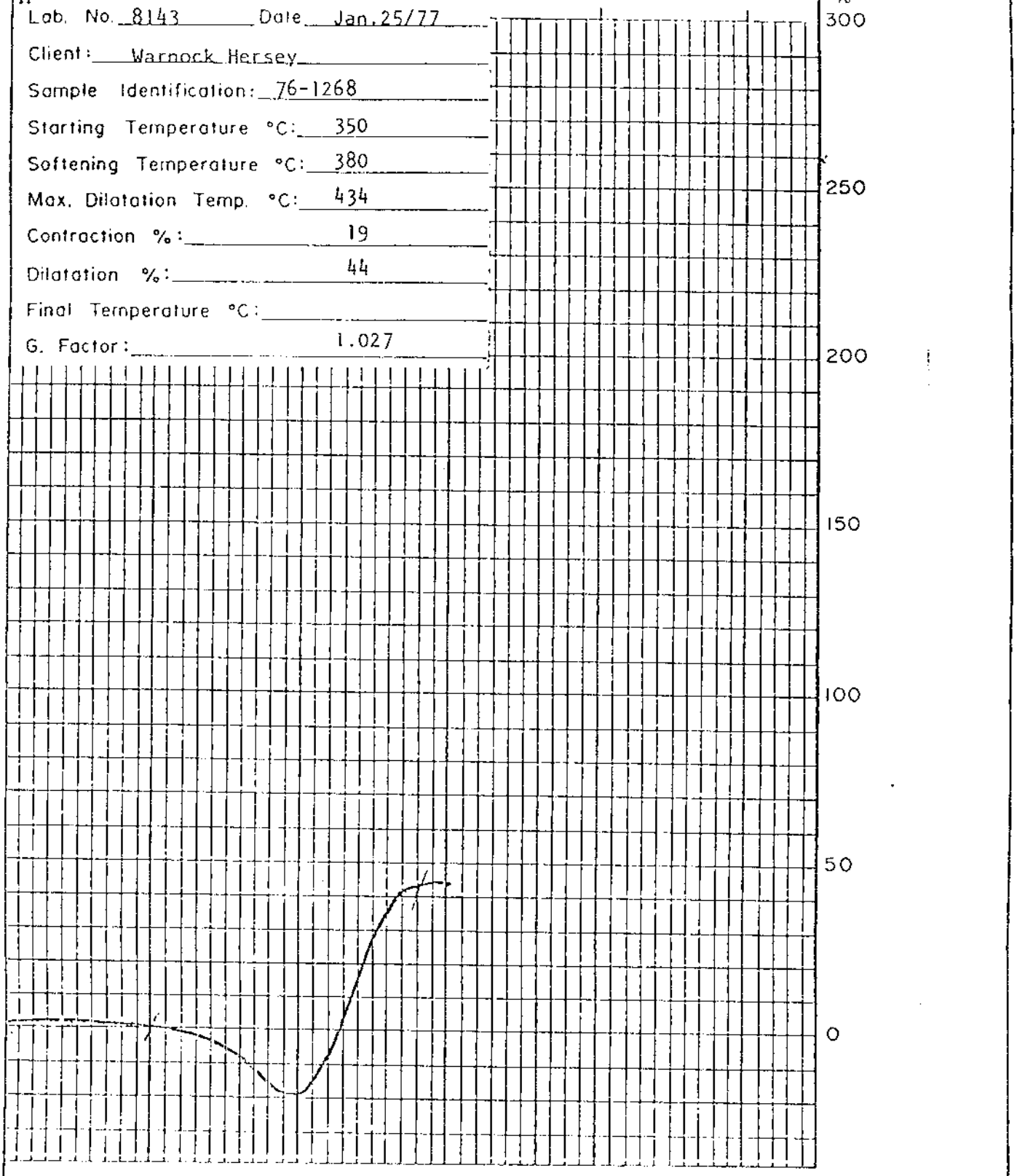
Max. Dilatation Temp. °C: 434

Contraction %: 19

Dilatation %: 44

Final Temperature °C:

G. Factor: 1.027



BIRTLEY ENGINEERING (CANADA) LTD.

Title	Date
RUHR DILATOMETER TEST	
	Drawn

Warnock Hersey Professional Services Ltd.

ELCO MINING LTD.. Elk River Coal Project 1970-77

DRILL CORE ANALYSIS

Sample Identification: DH 32 - 7 Warnock Hersey Lab. No.: 76 - 1269

TABLE I Raw Coal Head Sample ¼" x 0

AIR DRIED BASIS						% DRY BASIS			
Moist.	Ash	V.M.	F. C.	Sulphur	H.G.I.	Ash	V. M.	F.C.	Sulphur
0.7	15.0	22.4	61.9	1.22	147.4	15.1	22.5	62.4	1.23

TABLE II Screen Analysis

	AIR DRIED BASIS				DRY BASIS	
Size	Weight %	Moisture	ASH	Sulphur	ASH	Sulphur
¼" x 65	75.3	0.6	15.7	1.33	15.8	1.34
65 x 0	24.7	0.6	9.4	1.08	9.5	1.09
TOTAL	100.0	- -	- -	- -	14.2	1.28

TABLE III Float/Sink ¼" x 65 Fraction

Spec. Grav.		AIR DRIED BASIS						DRY BASIS			
Sink	Float	Weight%	Moist.	Ash	V.M.	F.C.	Sulphur	ASH	V.M.	F C.	Sulphur
	1.40	71.7	0.6	3.5	26.7	69.2	1.38	3.5	26.8	69.7	1.39
1.40	1.50	5.8	0.6	10.6	24.0	64.8	0.92	10.7	24.2	65.1	0.93
1.50	1.60	5.2	0.6	16.4	23.4	59.6	0.88	16.6	23.6	59.8	0.88
1.60		17.3	- -	- -	- -	- -	- -	62.7	- -	- -	- -
TOTAL		100.0	- -	- -	- -	- -	- -	14.8	- -	- -	- -

TABLE IV Cumulative 1.60 Float

F.S.I.	Phosphorus (in coal)	DILATATION					
		TEMPERATURE °C			PER CENT		"G" FACTOR
		Initial	Softening	Maximum Dilatation	Maximum Contraction	Maximum Dilatation	
8	0.009						

Lab. No. 8144 Date Jan. 25/ 77

Client: Warnock Hersey

Sample Identification: 76-1269

Starting Temperature °C: 350

Softening Temperature °C: 386

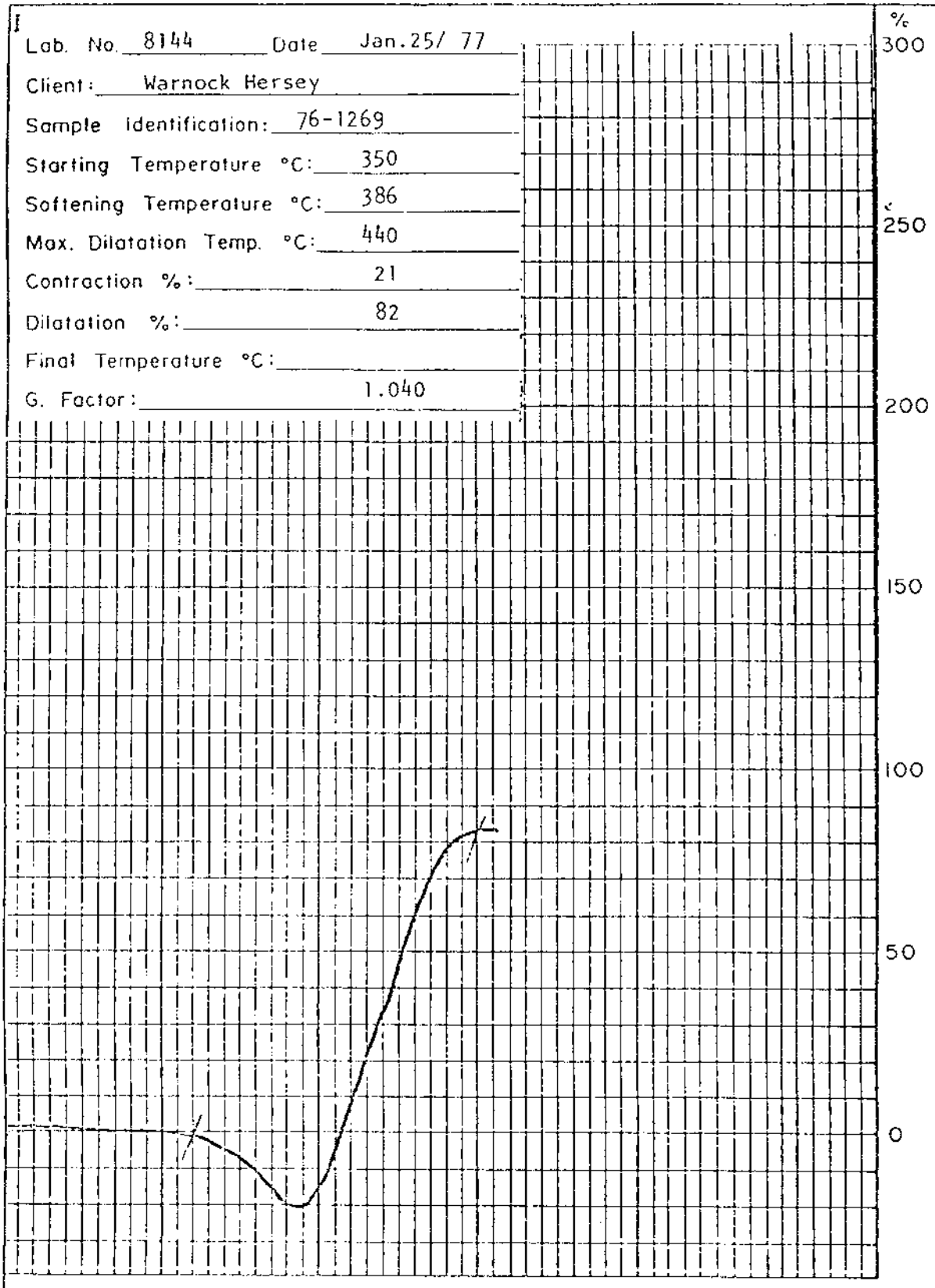
Max. Dilatation Temp. °C: 440

Contraction %: 21

Dilatation %: 82

Final Temperature °C:

G. Factor: 1.040



BIRTLEY ENGINEERING (CANADA) LTD.

Title

RUHR DILATOMETER TEST

Date

Drawn

Warnock Hersey Professional Services Ltd.

ELCO MINING LTD.. Elk River Coal Project 1976-77

DRILL CORE ANALYSIS

Sample Identification: DH 32 - 8 Warnock Hersey Lab. No.: 76 - 1270

TABLE I Raw Coal Head Sample ¼" x 0

AIR DRIED BASIS						% DRY BASIS			
Moist.	Ash	V.M.	F. C.	Sulphur	H.G. I.	Ash	V. M.	F.C.	Sulphur
0.6	20.0	21.9	57.5	1.52	110.0	20.2	22.0	57.8	1.53

TABLE II Screen Analysis

	AIR DRIED BASIS				DRY BASIS	
Size	Weight %	Moisture	ASH	Sulphur	ASH	Sulphur
¼" x 65	78.3	0.6	21.4	1.66	21.6	1.67
65 x 0	21.7	0.7	11.7	1.21	11.8	1.22
TOTAL	100.0	--	--	--	19.3	1.57

TABLE III Float/Sink ¼" x 65 Fraction

Spec. Grav.		AIR DRIED BASIS						DRY BASIS			
Sink	Float	Weight%	Moist.	Ash	V.M.	F.C.	Sulphur	ASH	V.M.	F.C.	Sulphur
	1.40	60.8	0.7	4.4	24.6	70.3	1.65	4.4	24.8	70.8	1.66
1.40	1.50	9.7	0.7	8.9	23.2	67.2	0.92	9.0	23.4	67.6	0.93
1.50	1.60	4.3	0.6	16.9	22.1	60.4	0.81	17.0	22.3	60.7	0.82
1.60		25.2	--	--	--	--	--	67.6	--	---	--
TOTAL		100.0	--	--	--	--	--	21.3	--	--	--

TABLE IV Cumulative 1.60 Float

F.S.I.	Phosphorus (in coal)	DILATATION					
		TEMPERATURE °C			PER CENT		"G" FACTOR
		Initial	Softening	Maximum Dilatation	Maximum Contraction	Maximum Dilatation	
9	0.026						

Lab. No. 8145 Date Jan. 25/77

Client: Warnock Hersey

Sample Identification: 76-1270

Starting Temperature °C: 350

Softening Temperature °C: 383

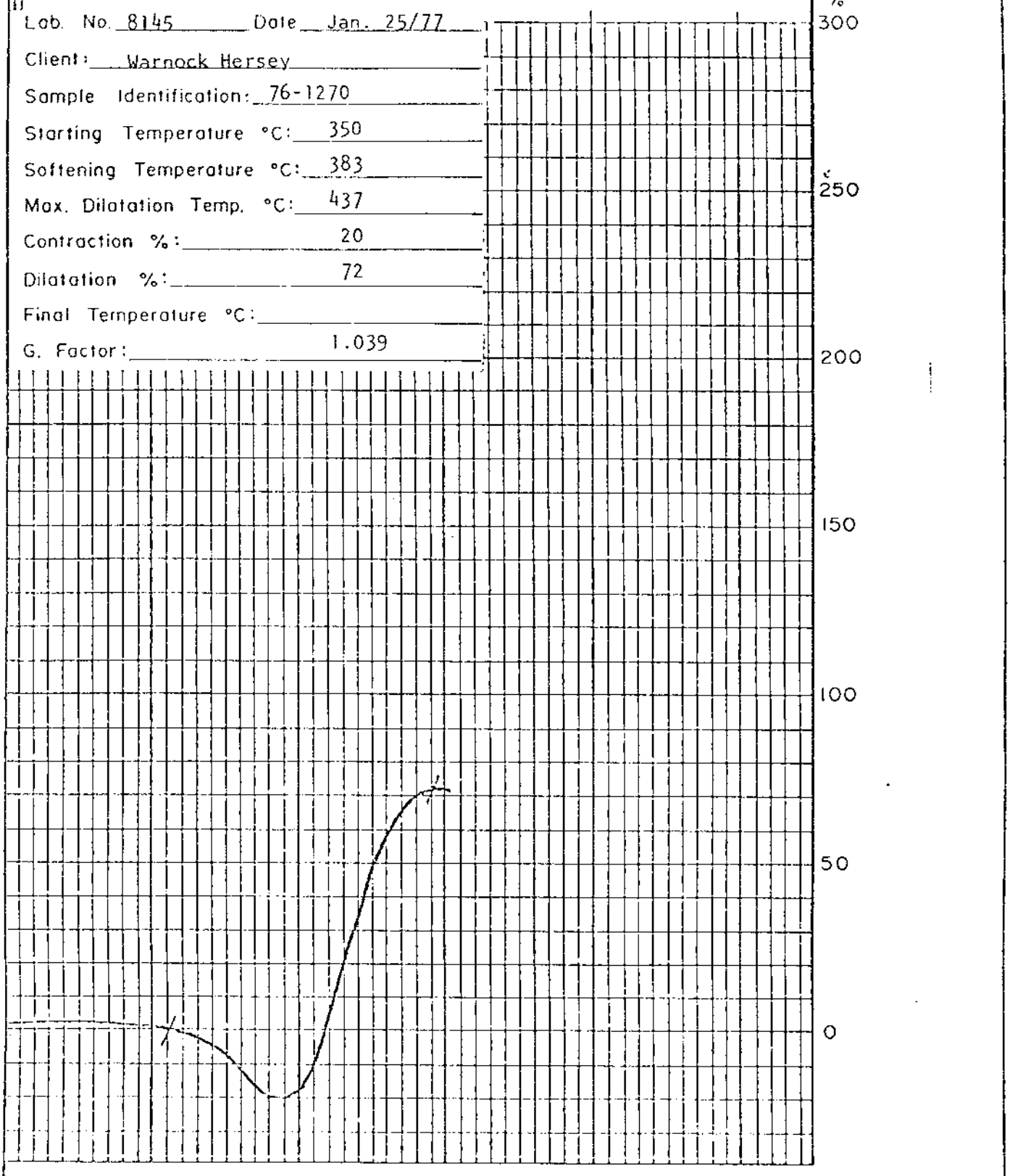
Max. Dilatation Temp. °C: 437

Contraction %: 20

Dilatation %: 72

Final Temperature °C:

G. Factor: 1.039



BIRTLEY ENGINEERING (CANADA) LTD.

Title

RUHR DILATOMETER TEST

Date

Drawn

Warnock Hersey Professional Services Ltd.

ELCO MINING LTD.. Elk River Coal Project 1976-77

DRILL CORE ANALYSIS

Sample Identification: DH 32 - 9 Warnock Hersey Lab. No.: 76 - 1271

TABLE I Raw Coal Head Sample ¼" x 0

AIR DRIED BASIS						% DRY BASIS			
Moist.	Ash	V.M.	F. C.	Sulphur	H.G.I.	Ash	V. M.	F.C.	Sulphur
0.6	16.0	21.3	62.1	0.79	110.0	16.1	21.4	62.5	0.80

TABLE II Screen Analysis

Size	AIR DRIED BASIS				DRY BASIS	
	Weight %	Moisture	ASH	Sulphur	ASH	Sulphur
¼" x 65	79.0	0.5	15.8	0.82	15.9	0.82
65 x 0	21.0	0.6	16.0	0.89	16.2	0.90
TOTAL	100.0	--	--	--	16.0	0.84

TABLE III Float/Sink ¼" x 65 Fraction

Spec. Grav.		AIR DRIED BASIS						DRY BASIS			
Sink	Float	Weight%	Moist.	Ash	V.M.	F.C.	Sulphur	ASH	V.M.	F.C.	Sulphur
	1.40	65.6	0.6	5.4	24.2	69.8	0.87	5.4	24.3	70.3	0.87
1.40	1.50	11.6	0.6	13.4	21.6	64.4	0.71	13.4	21.8	64.8	0.71
1.50	1.60	5.6	0.6	23.4	20.0	56.0	0.58	23.6	20.1	56.3	0.58
1.60		17.2	--	--	--	--	--	57.7	--	--	--
TOTAL		100.0	--	--	--	--	--	16.3	--	--	--

TABLE IV Cumulative 1.60 Float

F.S.I.	Phosphorus (in coal)	DILATATION					
		TEMPERATURE °C			PER CENT		"G" FACTOR
		Initial	Softening	Maximum Dilatation	Maximum Contraction	Maximum Dilatation	
8	0.026						

Lab. No. 8146 Date Jan. 25/77

Client: Warnock Hersey

Sample Identification: 76-1271

Starting Temperature °C: 350

Softening Temperature °C: 383

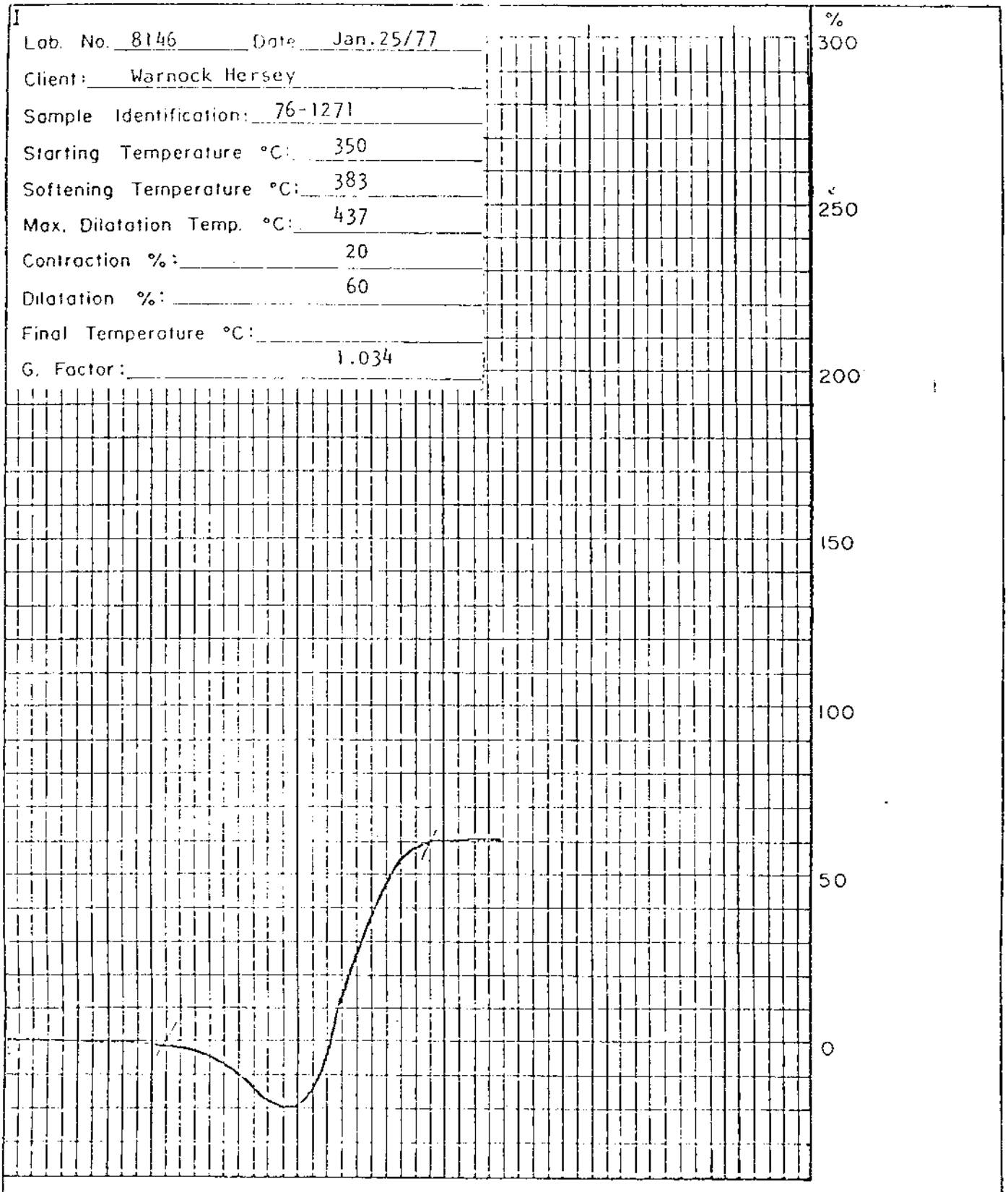
Max. Dilatation Temp. °C: 437

Contraction %: 20

Dilatation %: 60

Final Temperature °C:

G. Factor: 1.034



BIRTLEY ENGINEERING (CANADA) LTD.

Title	Date
RUHR DILATOMETER TEST	
	Drawn

Warnock Hersey Professional Services Ltd.

ELCO MINING LTD.. Elk River Coal Project 1976-77

DRILL CORE ANALYSIS

Sample Identification: DH 32 - 10 Warnock Hersey Lab. No.: 76 - 1272

TABLE I Raw Coal Head Sample ¼" x 0

AIR DRIED BASIS						% DRY BASIS			
Moist.	Ash	V.M.	F. C.	Sulphur	H.G. I.	Ash	V. M.	F.C.	Sulphur
0.6	23.2	21.2	55.0	0.87	105.2	23.4	21.4	55.2	0.88

TABLE II Screen Analysis

	AIR DRIED BASIS				DRY BASIS	
Size	Weight %	Moisture	ASH	Sulphur	ASH	Sulphur
¼" x 65	73.9	0.6	27.2	0.90	27.4	0.91
65 x 0	26.1	0.7	12.3	0.93	12.4	0.94
TOTAL	100.0	- -	- -	- -	23.5	0.92

TABLE III Float/Sink ¼" x 65 Fraction

Spec. Grav.		AIR DRIED BASIS						DRY BASIS			
Sink	Float	Weight%	Moist.	Ash	V.M.	F.C.	Sulphur	ASH	V.M.	F C.	Sulphur
	1.40	55.1	0.6	5.0	24.2	70.2	0.96	5.0	24.3	70 .7	0.97
1.40	1.50	7.0	0.7	17.3	20.2	61.8	0.79	17.4	20.3	62.3	0.80
1.50	1.60	3.9	0.7	23.3	20.0	56.0	0.72	23.4	20.1	56.5	0.73
1.60		34.0	- -	- -	- -	- -	- -	69.4	- -	- -	- -
TOTAL		100.0	- -	- -	- -	- -	- -	25.7	- -	- -	- -

TABLE IV Cumulative 1.60 Float

F.S.I.	Phosph-orus (in coal)	DILATATION					
		TEMPERATURE °C			PER CENT		" G " FACTOR
		Initial	Softening	Maximum Dilatation	Maximum Contraction	Maximum Dilatation	
8	0.021						

Lab. No. 8147 Date Jan.25/77

Client: Warnock Hersey

Sample Identification: 76-1272

Starting Temperature °C: 350

Softening Temperature °C: 386

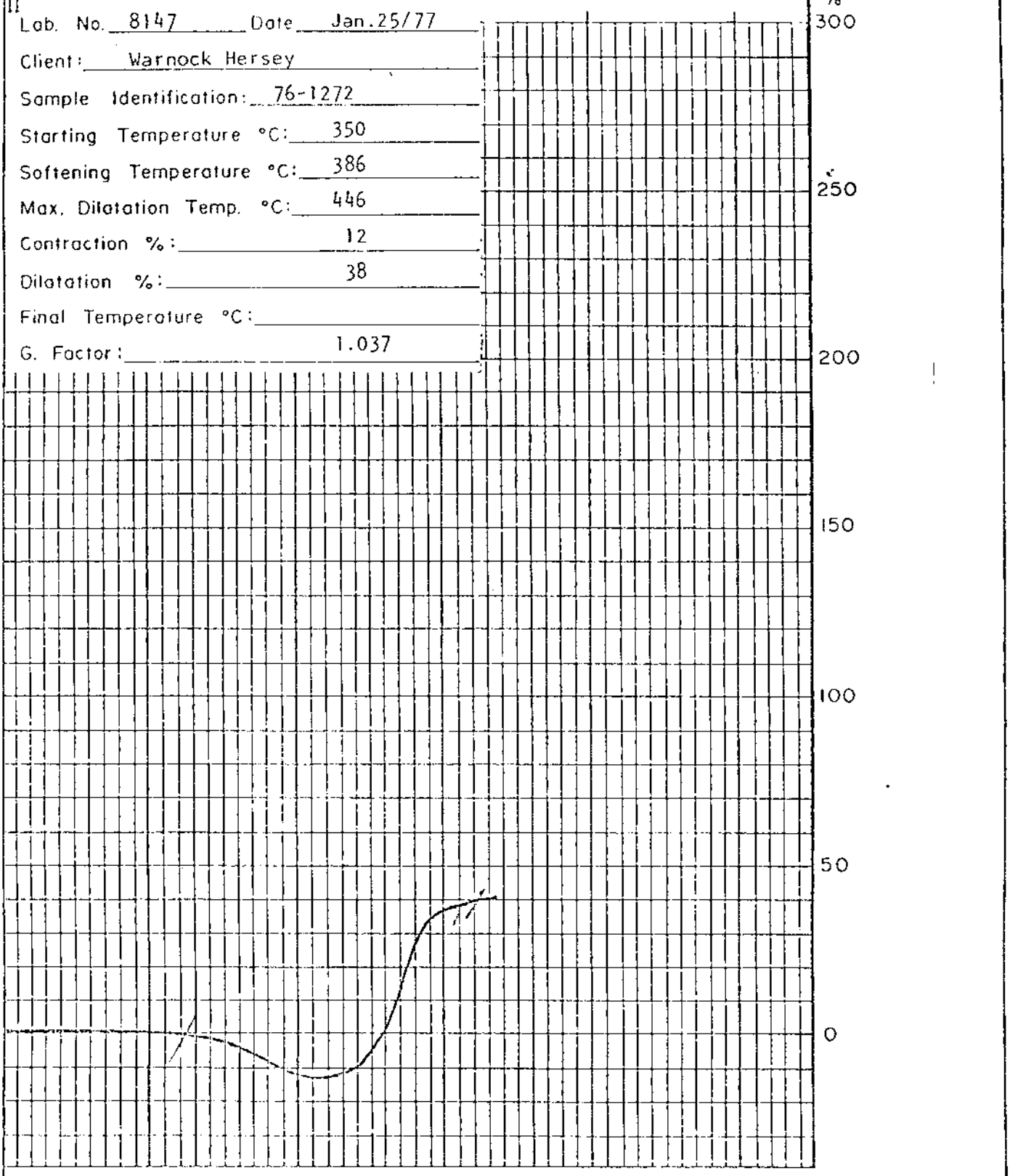
Max. Dilatation Temp. °C: 446

Contraction %: 12

Dilatation %: 38

Final Temperature °C:

G. Factor: 1.037



BIRTLEY ENGINEERING (CANADA) LTD.

Title

RUHR DILATOMETER TEST

Date

Drawn

ELCO MINING LTD.

CORE SAMPLE ANALYSIS

HOLE NO.: DH-33-1 Lab. No. 8212 DATE: Jan/77

HEAD RAW ANALYSIS						
R.M. %	ASH %	V.M. %	F.C. %	S. %	H.G.I.	REMARKS
0.9	10.2	25.1	63.8	0.75	74	Air Dried Basis
	10.3	25.3	64.4	0.76	--	Dry Basis

SIZE / RAW ANALYSES								
SIZE FRACTION	WT. %	R.M. %	ASH %	S. %	CUMULATIVE WT. %	CUMULATIVE ASH %	CUMULATIVE S. %	
1/4" x 65M	95.4	1.0	10.9	0.71	95.4	10.9	0.71	A.D.B.
	95.4		11.0	0.72	95.4	11.0	0.72	D.B.
65M x 0	4.6	1.4	8.5	0.80	100.0	10.8	0.71	A.D.B.
	4.6		8.6	0.81	100.0	10.9	0.72	D.B.

SINK - FLOAT ANALYSIS: 1/4" x 65M									
S. G.	WT. %	R.M. %	ASH %	V.M. %	F.C. %	S. %	CUMULATIVE WT. %	CUMULATIVE ASH %	
-1.40	84.5	0.7	3.5	27.4	68.4	0.79	84.5	3.5	A.D.B.
	84.5		3.5	27.6	68.9	0.80	84.5	3.5	D.B.
1.40-1.50	4.0	0.7	18.8	23.1	57.4	0.61	88.5	4.2	A.D.B.
	4.0		18.9	23.3	57.8	0.61	88.5	4.2	D.B.
1.50-1.60	2.3	0.9	31.0				90.8	4.8	A.D.B.
	2.3		31.3				90.8	4.9	D.B.
+1.60	9.2	0.7	71.8				100.0	11.0	A.D.B.
	9.2		72.3				100.0	11.1	D.B.

COMPOSITE 1/4" x 65M FLOATS @ 1.50 S.G., A.D.B.						
F.S.I.	P% ON COAL	DILATATION TEST				
		SOFTENING TEMP. (°C)	MAX. DIL. TEMP. (°C)	MAXIMUM CONTR. %	MAXIMUM DIL. %	G. NO.
5 1/2	.06	370	434	18	76	1.052

Birtley Engineering

Subsidiary of Great West Steel Industries

Lab. No. 8212 Date Jan 28, 1977

Client: ELCO MINING LTD.

Sample Identification: DH-33-1

Starting Temperature °C: 350

Softening Temperature °C: 370

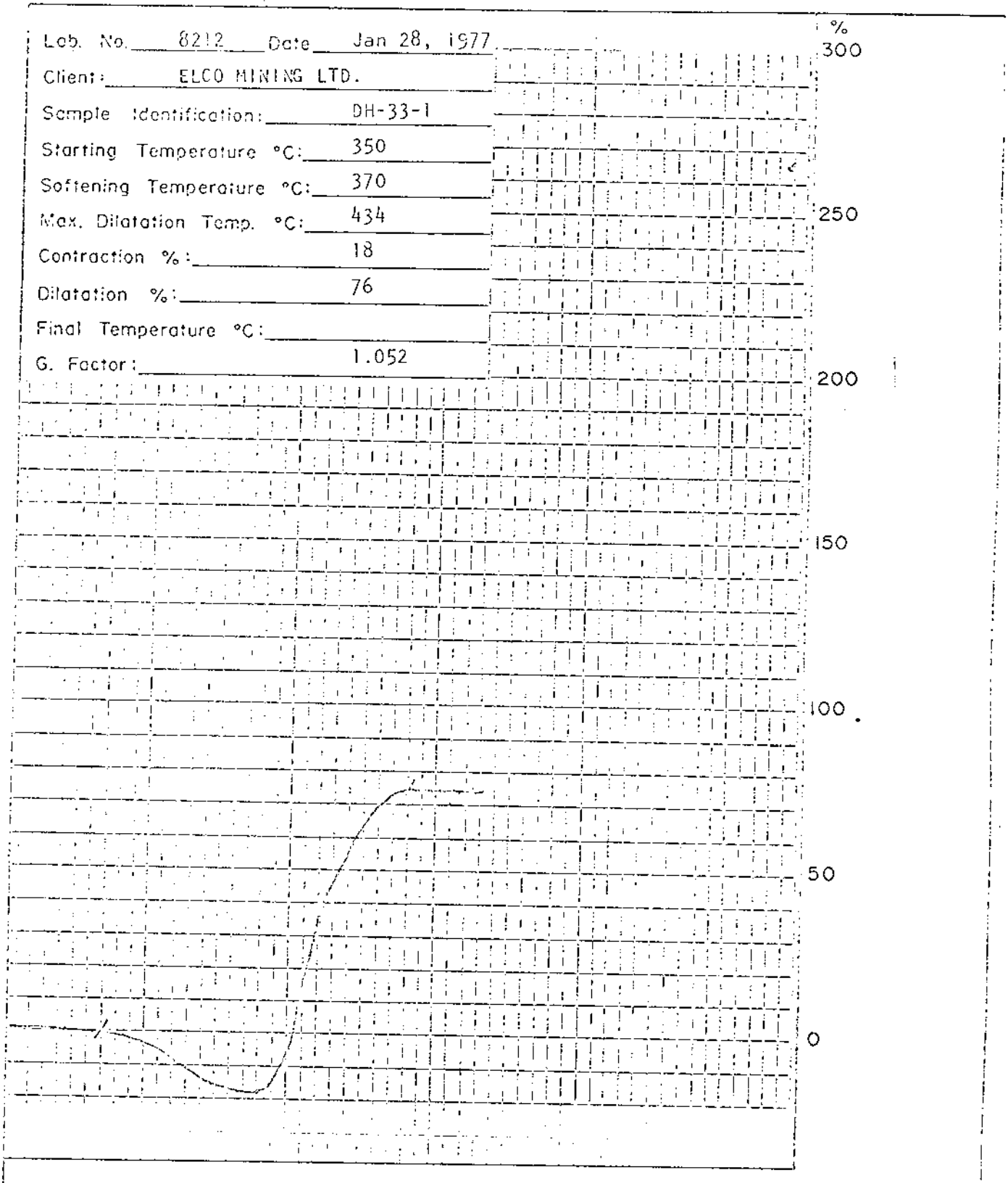
Max. Dilatation Temp. °C: 434

Contraction %: 18

Dilatation %: 76

Final Temperature °C:

G. Factor: 1.052



BARTLEY ENGINEERING (CANADA) LTD.

Title

RUHR DILATOMETER TEST

Date

Drawn

ELCO MINING LTD.

CORE SAMPLE ANALYSIS

HOLE NO.: DH-33-2 Lab. No. 8213 DATE: Jan/77

HEAD RAW ANALYSIS						
R.M. %	ASH %	V.M. %	F.C. %	S. %	H.G.I.	REMARKS
1.3	22.1	23.1	53.5	0.80	101	Air Dried Basis
	22.4	23.4	54.2	0.81	---	Dry Basis

SIZE / RAW ANALYSES								
SIZE FRACTION	WT. %	R.M. %	ASH %	S. %	CUMULATIVE WT. %	CUMULATIVE ASH %	CUMULATIVE S. %	
1/4" x 65M	87.2	1.0	24.3	0.75	87.2	24.3	0.75	A.D.B.
	87.2		24.5	0.76	87.2	24.5	0.76	D.B.
65M x 0	12.8	1.3	14.0	0.94	100.0	23.0	0.77	A.D.B.
	12.8		14.2	0.95	100.0	23.2	0.78	D.B.

SINK - FLOAT ANALYSIS: 1/4" x 65M									
S. G.	WT. %	R.M. %	ASH %	V.M. %	F.C. %	S. %	CUMULATIVE WT. %	CUMULATIVE ASH %	
-1.40	64.5	2.2	4.1	27.7	66.0	0.96	64.5	4.1	A.D.B.
	64.2		4.2	28.3	67.5	0.98	64.2	4.2	D.B.
1.40-1.50	4.6	1.2	17.6	23.2	58.0	0.87	69.1	5.0	A.D.B.
	4.6		17.8	23.5	58.7	0.88	68.8	5.1	D.B.
1.50-1.60	4.2	1.5	27.7				73.3	6.3	A.D.B.
	4.2		28.1				73.0	6.4	D.B.
+1.60	26.7	0.9	73.5				100.0	24.2	A.D.B.
	27.0		74.2				100.0	24.7	D.B.

COMPOSITE 1/4" x 65M FLOATS @ 1.50 S.G., A.D.B.						
F.S.I.	P% ON COAL	DILATATION TEST SOFTENING TEMP. (°C)	MAX. DIL. TEMP. (°C)	MAXIMUM CONTR. %	MAXIMUM DIL. %	G. NO.
8	.06	368	428	18	139	1.062

Birtley Engineering

Subsidiary of Great West Steel Industries

Lab. No. 8213 Date Jan 28, 1977

Client: ELCO MINING LTD.

Sample Identification: DH-33-2

Starting Temperature °C: 350

Softening Temperature °C: 368

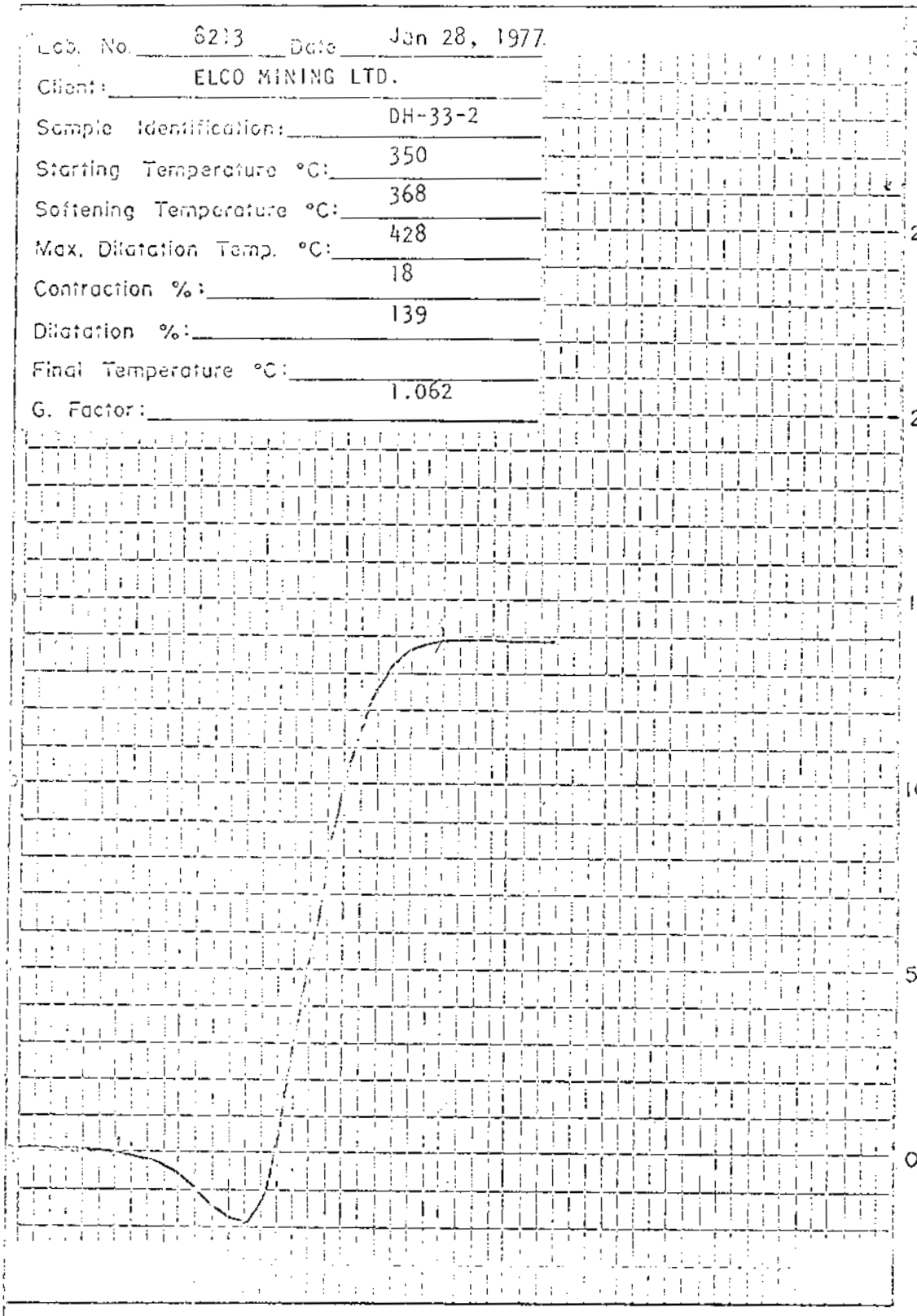
Max. Dilatation Temp. °C: 428

Contraction %: 18

Dilatation %: 139

Final Temperature °C:

G. Factor: 1.062



DIRTLEY ENGINEERING (CANADA) LTD.

Title	Date
RUHR DILATOMETER TEST	
	Drawn

ELCO MINING LTD.

CORE SAMPLE ANALYSIS

HOLE NO.: DH-33-3 Lab. No. 8214 DATE: Jan/77

HEAD RAW ANALYSIS						
R.M. %	ASH %	V.M. %	F.C. %	S. %	H.G.I.	REMARKS
0.6	42.2	18.9	38.3	0.63	66	Air Dried Basis
	42.5	19.0	38.5	0.63	--	Dry Basis

SIZE/RAW ANALYSES								
SIZE FRACTION	WT. %	R.M. %	ASH %	S. %	CUMULATIVE WT. %	CUMULATIVE ASH %	CUMULATIVE S. %	
1/4" x 65M	95.9	0.7	43.2	0.62	95.9	43.2	0.62	A.D.B.
	96.0		43.5	0.62	96.0	43.5	0.62	D.B.
65M x 0	4.1	1.1	32.7	0.74	100.0	42.8	0.62	A.D.B.
	4.1		33.1	0.75	100.0	43.1	0.63	D.B.

SINK-FLOAT ANALYSIS: 1/4" x 65M									
S. G.	WT. %	R.M. %	ASH %	V.M. %	F.C. %	S. %	CUMULATIVE WT. %	CUMULATIVE ASH %	
-1.40	40.4	0.5	6.1	27.9	65.5	0.94	40.4	6.1	A.D.B.
	40.5		6.1	28.0	65.9	0.94	40.5	6.1	D.B.
1.40-1.50	7.1	0.4	22.3	23.7	53.6	0.80	47.5	8.5	A.D.B.
	7.1		22.4	23.8	53.8	0.80	47.6	8.5	D.B.
1.50-1.60	4.7	0.5	33.4				52.2	10.8	A.D.B.
	4.7		33.6				52.3	10.8	D.B.
+1.60	47.8	0.6	79.7				100.0	43.7	A.D.B.
	47.7		80.2				100.0	43.9	D.B.

COMPOSITE 1/4" x 65M FLOATS @ 1.50 S.G., A.D.B.						
F.S.I.	P% ON COAL	DILATATION TEST				
		SOFTENING TEMP. (°C)	MAX. DIL. TEMP. (°C)	MAXIMUM CONTR. %	MAXIMUM DIL. %	G. NO.
8	.03	356	443	24	271	1.100

Birtley Engineering

Subsidiary of Great West Steel Industries

Lab. No. 8214 Date Jan 31, 1977

Client: ELCO MINING LTD.

Sample Identification: DH-33-3

Starting Temperature °C: 350

Softening Temperature °C: 356

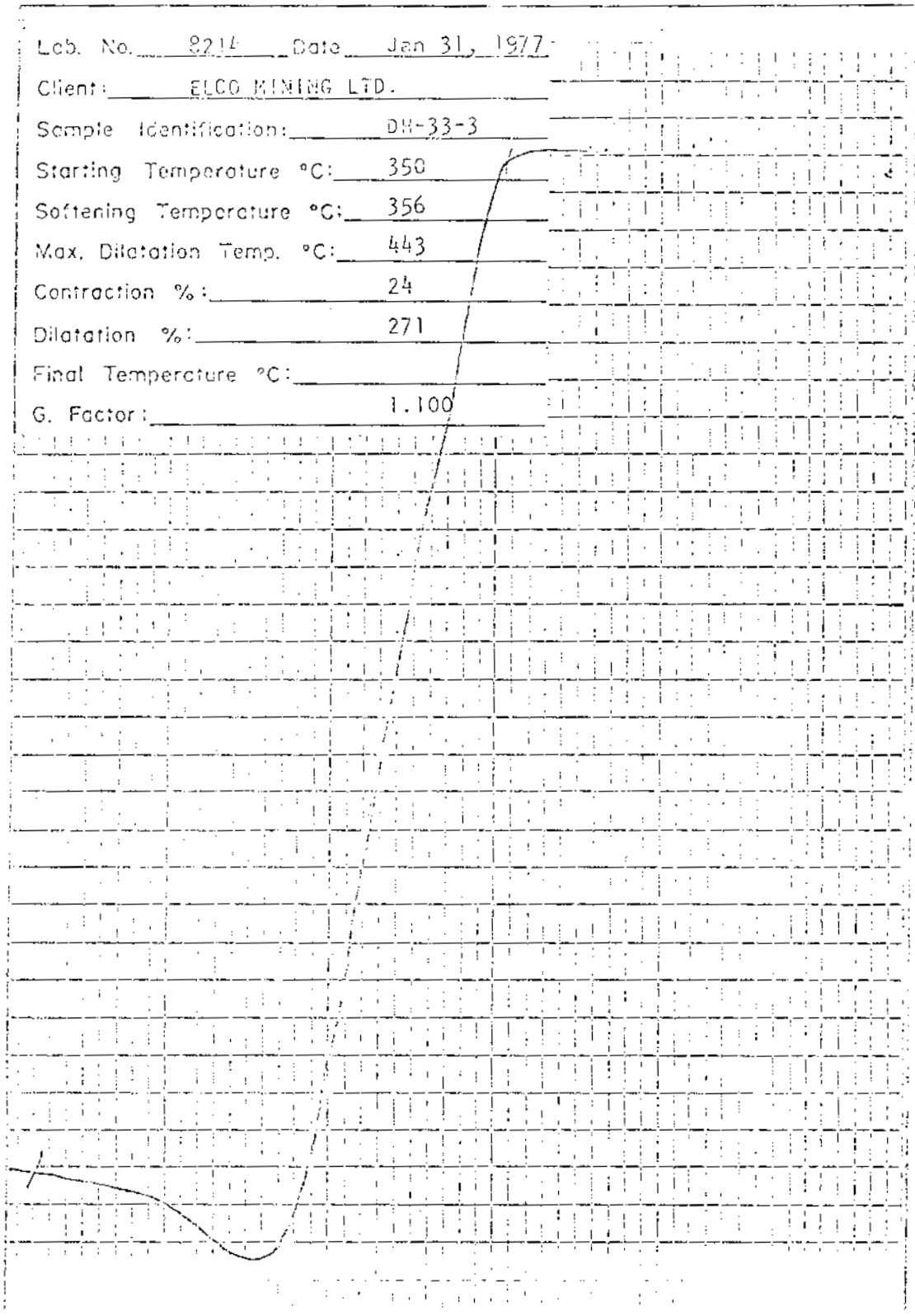
Max. Dilatation Temp. °C: 443

Contraction %: 24

Dilatation %: 271

Final Temperature °C:

G. Factor: 1.100



BARTLEY ENGINEERING (CANADA) LTD.

Title	Date
RUHR DILATOMETER TEST	
	Drawn

ELCO MINING LTD.

CORE SAMPLE ANALYSIS

HOLE NO.: DH-33-4 Lab. No. 8215 DATE: Jan/77

HEAD RAW ANALYSIS						
R.M. %	ASH %	V.M. %	F.C. %	S. %	H.G.I.	REMARKS
0.7	11.1	24.3	63.9	1.08	84	Air Dried Basis
	11.2	24.5	64.3	1.09	--	Dry Basis

SIZE/RAW ANALYSES								
SIZE FRACTION	WT. %	R.M. %	ASH %	S. %	CUMULATIVE WT. %	CUMULATIVE ASH %	CUMULATIVE S. %	
1/4" x 65M	94.1	0.9	11.4	1.06	94.1	11.4	1.06	A.D.B.
	94.1		11.5	1.07	94.1	11.5	1.07	D.B.
65M x 0	5.9	1.0	16.4	1.19	100.0	11.7	1.07	A.D.B.
	5.9		16.6	1.20	100.0	11.8	1.08	D.B.

SINK-FLOAT ANALYSIS: 1/4" x 65M									
S. G.	WT. %	R.M. %	ASH %	V.M. %	F.C. %	S. %	CUMULATIVE WT. %	CUMULATIVE ASH %	
-1.40	86.9	0.7	4.8	26.5	68.0	1.06	86.9	4.8	A.D.B.
	86.9		4.8	26.7	68.5	1.07	86.9	4.8	D.B.
1.40-1.50	3.0	0.7	17.8	21.3	60.2	1.04	89.9	5.2	A.D.B.
	3.0		17.9	21.5	60.6	1.05	89.9	5.2	D.B.
1.50-1.60	1.8	0.8	26.1				91.7	5.6	A.D.B.
	1.8		26.3				91.7	5.7	D.B.
+1.60	8.3	0.9	72.2				100.0	11.2	A.D.B.
	8.3		72.9				100.0	11.2	D.B.

COMPOSITE 1/4" x 65M FLOATS @ 1.50 S.G., A.D.B.						
F.S.I.	P% ON COAL	DILATATION TEST				
		SOFTENING TEMP. (°C)	MAX. DIL. TEMP. (°C)	MAXIMUM CONTR. %	MAXIMUM DIL. %	G. NO.
7 1/2	.07	374	446	18	78	1.058

Birtley Engineering

Subsidiary of Great West Steel Industries

Lab. No. 8215 Date Jan 31, 1977

Client: ELCO MINING LTD.

Sample Identification: DH-33-4

Starting Temperature °C: 350

Softening Temperature °C: 374

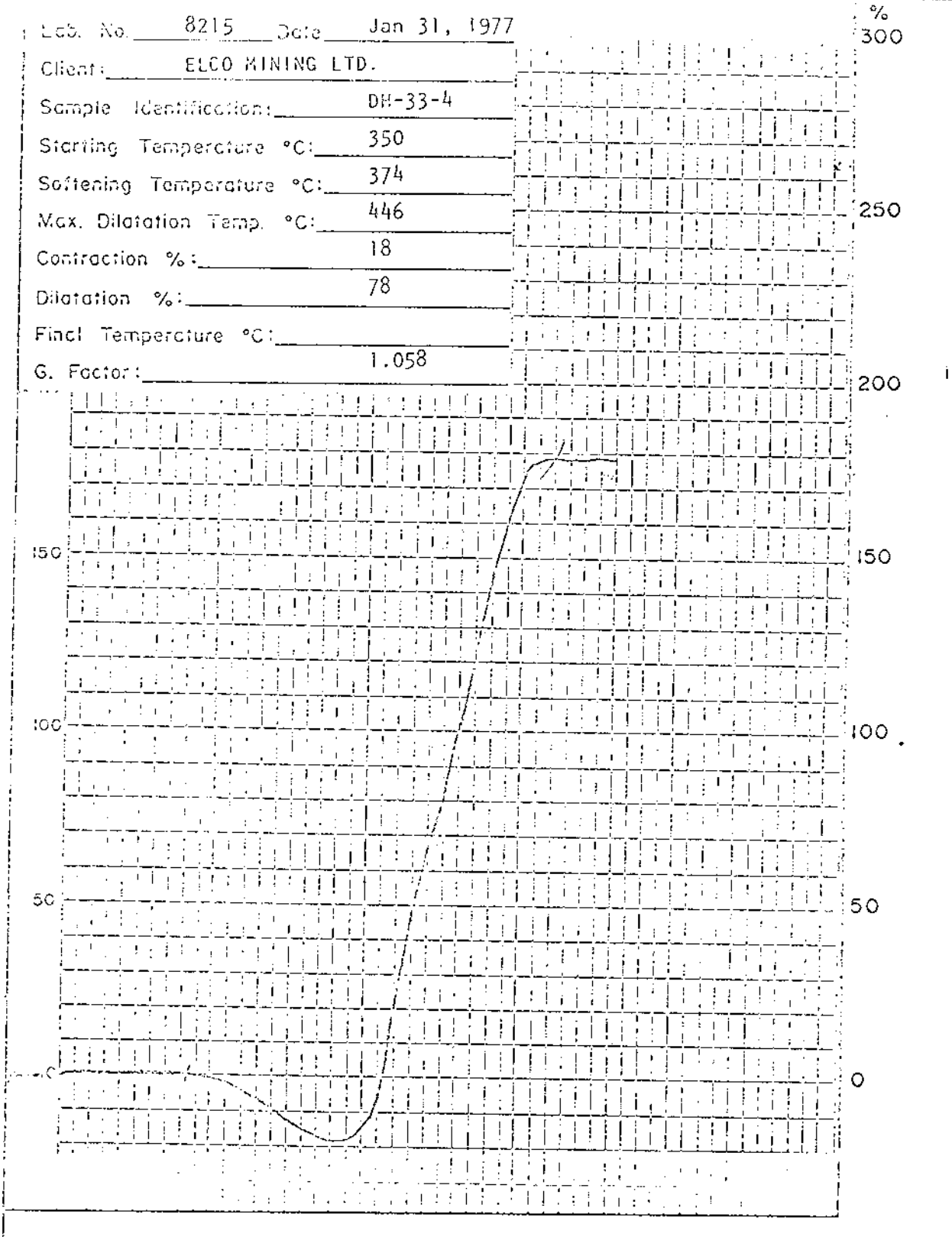
Max. Dilatation Temp. °C: 446

Contraction %: 18

Dilatation %: 78

Final Temperature °C:

G. Factor: 1.058



DIRTLEY ENGINEERING (CANADA) LTD.

Title

RUHR DILATOMETER TEST

Date

Drawn

ELCO MINING LTD.

CORE SAMPLE ANALYSIS

HOLE NO.: DH-33-5 Lab. No. 8216 DATE: Jan/77

HEAD RAW ANALYSIS						
R.M. %	ASH %	V.M. %	F.C. %	S. %	H.G.I.	REMARKS
0.5	31.3	22.0	46.2	1.33	90	Air Dried Basis
	31.5	22.1	46.4	1.34	--	Dry Basis

SIZE / RAW ANALYSES								
SIZE FRACTION	WT. %	R.M. %	ASH %	S. %	CUMULATIVE WT. %	CUMULATIVE ASH %	CUMULATIVE S. %	
1/4" x 65M	92.7	0.7	32.3	1.39	92.7	32.3	1.39	A.D.B.
	92.7		32.5	1.40	92.7	32.5	1.40	D.B.
65M x 0	7.3	0.9	20.0	0.98	100.0	31.4	1.36	A.D.B.
	7.3		20.2	0.99	100.0	31.6	1.37	D.B.

SINK-FLOAT ANALYSIS: 1/4" x 65M									
S. G.	WT. %	R.M. %	ASH %	V.M. %	F.C. %	S. %	CUMULATIVE WT. %	CUMULATIVE ASH %	
-1.40	52.7	1.2	4.4	25.7	68.7	1.00	52.7	4.4	A.D.B.
	52.6		4.5	26.0	69.5	1.01	52.6	4.5	D.B.
1.40-1.50	4.2	0.9	20.4	22.1	56.6	0.80	56.9	5.6	A.D.B.
	4.2		20.6	22.3	57.1	0.81	56.8	5.7	D.B.
1.50-1.60	3.9	1.1	29.6				60.8	7.1	A.D.B.
	3.9		29.9				60.7	7.2	D.B.
+1.60	39.2	0.8	73.0				100.0	32.9	A.D.B.
	39.3		73.6				100.0	33.3	D.B.

COMPOSITE 1/4" x 65M FLOATS @ 1.50 S.G., A.D.B.						
F.S.I.	P% ON COAL	DILATATION TEST				
		SOFTENING TEMP. (°C)	MAX. DIL. TEMP. (°C)	MAXIMUM CONTR. %	MAXIMUM DIL. %	G. NO.
7 1/2	.07	371	434	24	49	1.028

Birtley Engineering

Subsidiary of Great West Steel Industries

Lab. No. 8216 Date Jan 31, 1977

Client: ELCO MINING LTD.

Sample Identification: DH-33-5

Starting Temperature °C: 350

Softening Temperature °C: 371

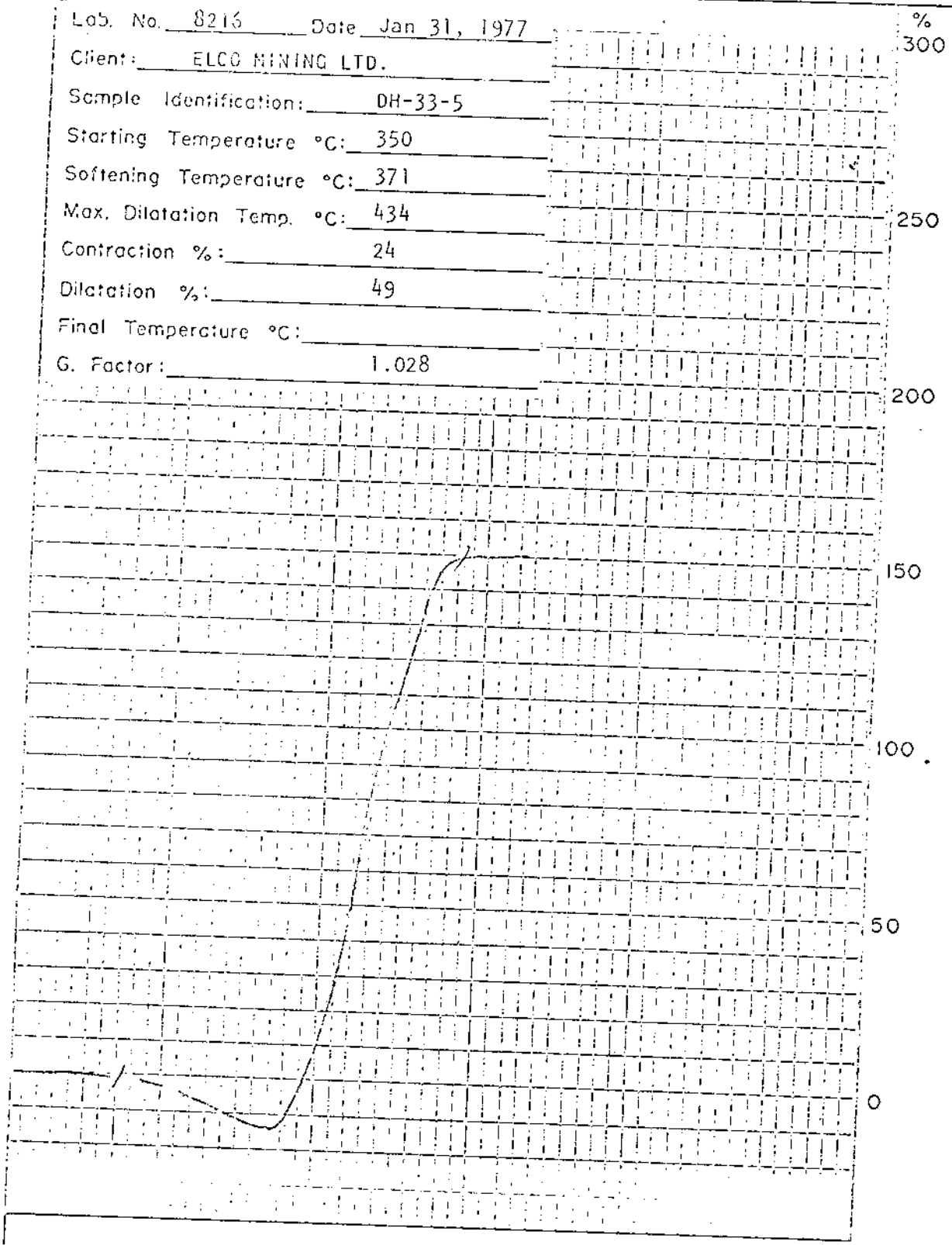
Max. Dilatation Temp. °C: 434

Contraction %: 24

Dilatation %: 49

Final Temperature °C:

G. Factor: 1.028



BATTLEY ENGINEERING (CANADA) LTD.

Title

RUHR DILATOMETER TEST

Date

Drawn

Warnock Hersey Professional Services Ltd.

ELCO MINING LTD.. Elk River Coal Project 1976-77

DRILL CORE ANALYSIS

Sample Identification: DH 34 - 1 Warnock Hersey Lab. No.: 76 - 1273

TABLE I Raw Coal Head Sample ¼" x 0

AIR DRIED BASIS						% DRY BASIS			
Moist.	Ash	V.M.	F. C.	Sulphur	H.G. I.	Ash	V. M.	F.C.	Sulphur
0.8	18.7	28.4	52.1	0.65	75.4	18.8	28.7	52.5	0.66

TABLE II Screen Analysis

	AIR DRIED BASIS				DRY BASIS	
Size	Weight %	Moisture	ASH	Sulphur	ASH	Sulphur
¼" x 65	84.0	0.7	19.4	0.67	19.6	0.68
65 x 0	16.0	1.0	19.5	0.67	19.7	0.68
TOTAL	100.0	- -	- -	- -	19.6	0.68

TABLE III Float/Sink ¼" x 65 Fraction

Spec. Grav.		AIR DRIED BASIS						DRY BASIS			
Sink	Float	Weight%	Moist.	Ash	V.M.	F.C.	Sulphur	ASH	V.M.	F.C.	Sulphur
	1.40	69.7	1.0	7.4	31.7	59.9	0.72	7.5	32.0	60.5	0.73
1.40	1.50	9.7	0.8	17.5	28.2	53.5	0.62	17.6	28.4	54.0	0.63
1.50	1.60	5.0	0.7	25.4	25.2	48.7	0.65	25.6	25.4	49.0	0.66
1.60		15.6	- -	- -	- -	- -	- -	64.7	- -	- -	- -
TOTAL		100.0	- -	- -	- -	- -	- -	18.3	- -	- -	- -

TABLE IV Cumulative 1.60 Float

F.S.I.	Phosphorus (in coal)	DILATATION					
		TEMPERATURE °C			PER CENT		"G" FACTOR
		Initial	Softening	Maximum Dilatation	Maximum Contraction	Maximum Dilatation	
8	0.042						

Lab. No. 8148 Date Jan. 25/77

Client: Warnock Hersey

Sample Identification: 76-1273

Starting Temperature °C: 350

Softening Temperature °C: 365

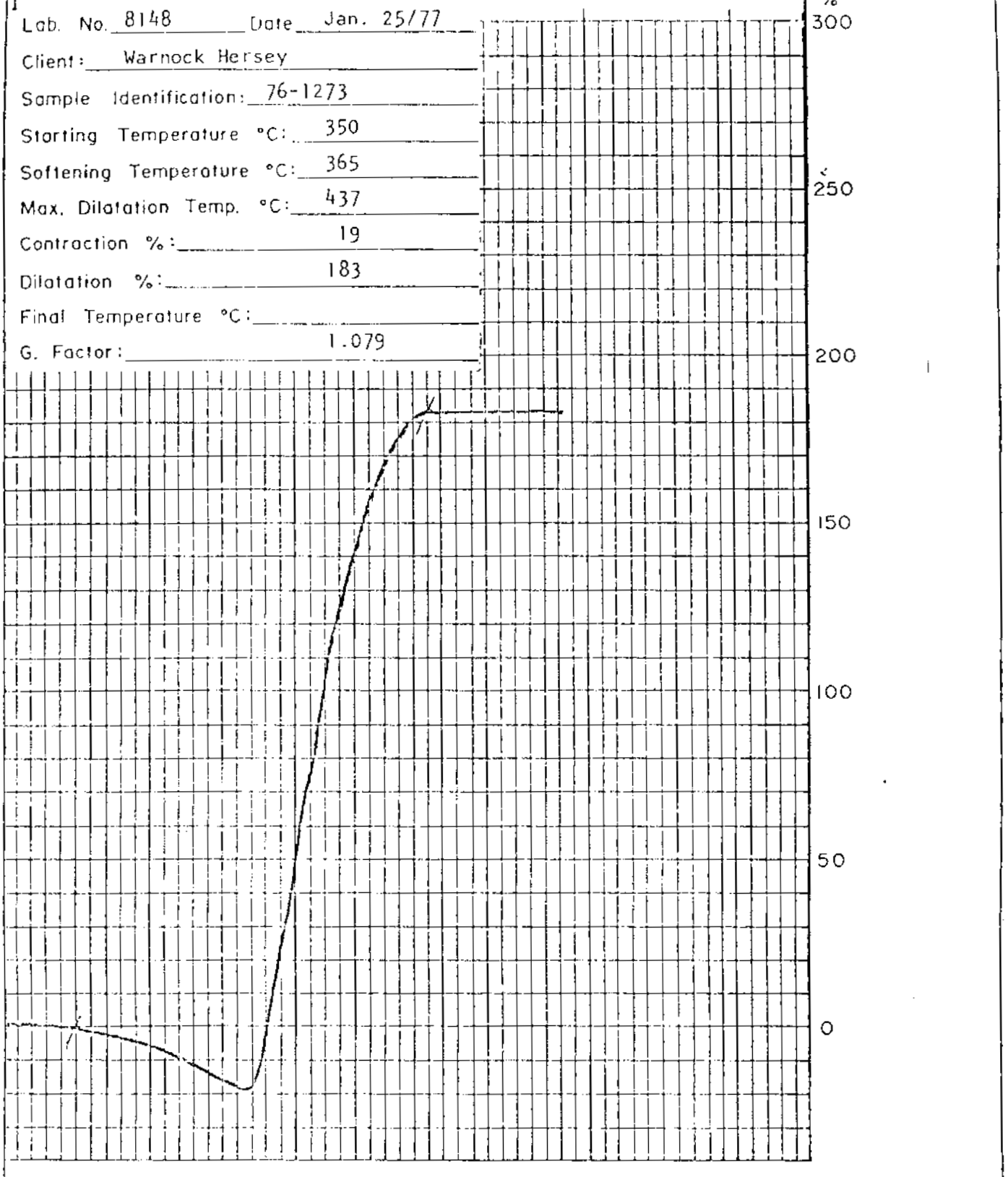
Max. Dilatation Temp. °C: 437

Contraction %: 19

Dilatation %: 183

Final Temperature °C:

G. Factor: 1.079



BIRTLEY ENGINEERING (CANADA) LTD.

Title	Date
RUHR DILATOMETER TEST	
	Drawn

Warnock Hersey Professional Services Ltd.

ELCO MINING LTD.. Elk River Coal Project 1976-77

DRILL CORE ANALYSIS

Sample Identification: DH 34 - 2 Warnock Hersey Lab. No.: 76 - 1274

TABLE I Raw Coal Head Sample ¼" x 0

AIR DRIED BASIS						% DRY BASIS			
Moist.	Ash	V.M.	F. C.	Sulphur	H.G.I.	Ash	V. M.	F.C.	Sulphur
0.9	35.4	25.0	38.7	0.78	82.3	35.7	25.3	39.0	0.79

TABLE II Screen Analysis

	AIR DRIED BASIS				DRY BASIS	
Size	Weight %	Moisture	ASH	Sulphur	ASH	Sulphur
¼" x 65	74.5	0.8	42.7	0.72	43.1	0.73
65 x 0	25.5	0.9	25.3	0.96	25.5	0.97
TOTAL	100.0	--	--	--	38.6	0.79

TABLE III Float/Sink ¼" x 65 Fraction

Spec. Grav.		AIR DRIED BASIS						DRY BASIS			
Sink	Float	Weight%	Moist.	Ash	V.M.	F.C.	Sulphur	ASH	V.M.	F.C.	Sulphur
	1.40	25.4	0.9	8.8	32.3	58.0	0.85	8.9	32.6	58.5	0.86
1.40	1.50	10.4	0.9	16.4	28.9	53.8	0.82	16.5	29.1	54.4	0.83
1.50	1.60	4.6	0.8	25.0	25.4	48.8	0.78	25.2	25.6	49.2	0.79
1.60		59.6	--	--	--	--	--	66.6	--	--	--
TOTAL		100.0	--	--	--	--	--	44.8	--	--	--

TABLE IV Cumulative 1.60 Float

F.S.I.	Phosphorus (in coal)	DILATATION					
		TEMPERATURE °C			PER CENT		"G" FACTOR
		Initial	Softening	Maximum Dilatation	Maximum Contraction	Maximum Dilatation	
8	0.008						

II

Lab. No. 8149 Date Jan. 25/77

Client: Warnock Hersey

Sample Identification: 76-1274

Starting Temperature °C: 350

Softening Temperature °C: 365

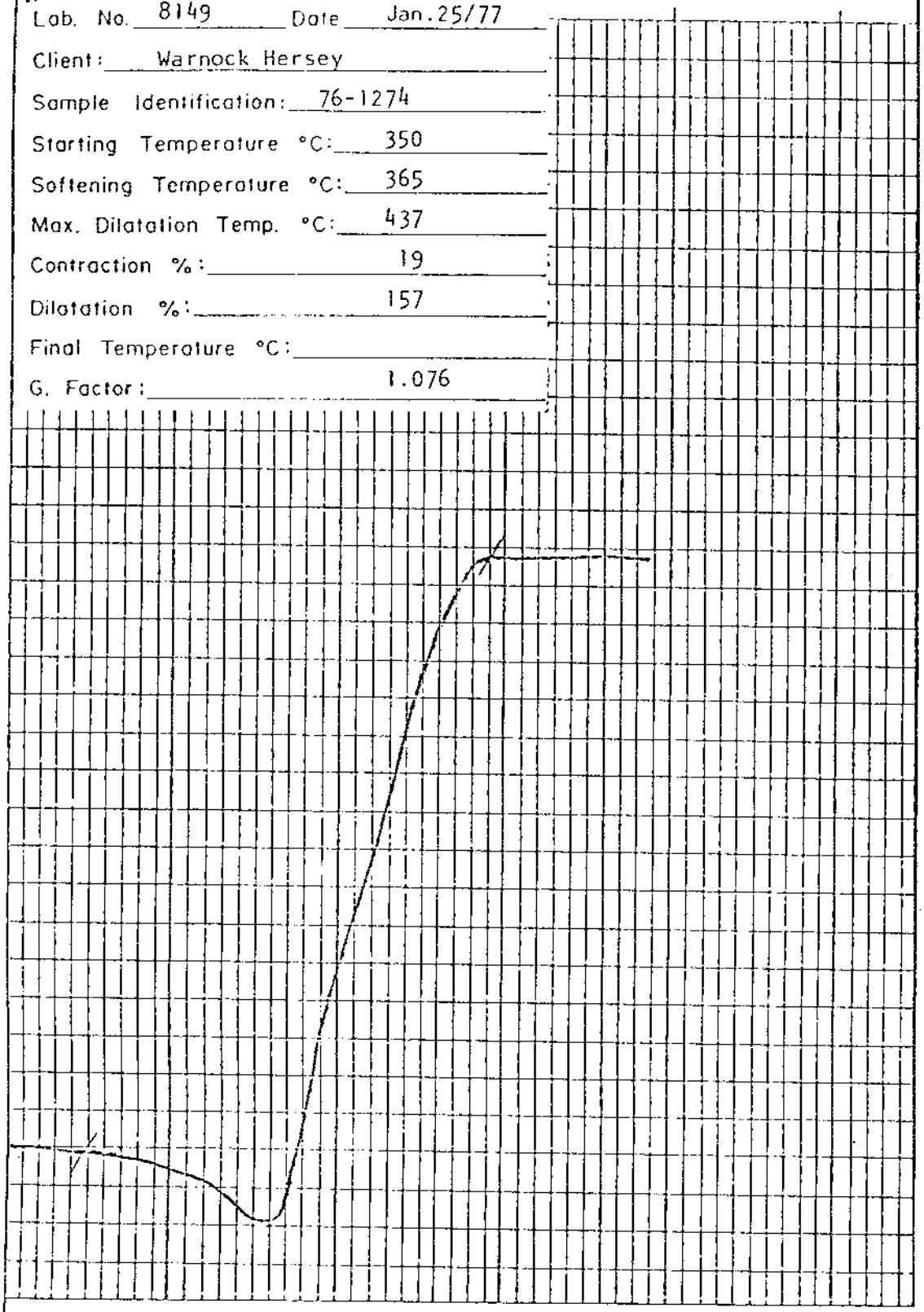
Max. Dilatation Temp. °C: 437

Contraction %: 19

Dilatation %: 157

Final Temperature °C:

G. Factor: 1.076



BIRTLEY ENGINEERING (CANADA) LTD.

Title	Date
RUHR DILATOMETER TEST	
	Drawn

Warnock Hersey Professional Services Ltd.

ELCO MINING LTD. — Elk River Coal Project 1976-77

DRILL CORE ANALYSIS

Sample Identification: DH 34 - 3 — Warnock Hersey Lab. No.: 76 - 1275

TABLE I Raw Coal Head Sample ¼" x 0

AIR DRIED BASIS						% DRY BASIS			
Moist.	Ash	V.M.	F. C.	Sulphur	H.G.I.	Ash	V. M.	F.C.	Sulphur
0.8	13.8	29.5	55.9	1.01	98.4	13.9	29.7	56.4	1.02

TABLE II Screen Analysis

	AIR DRIED BASIS				DRY BASIS	
Size	Weight %	Moisture	ASH	Sulphur	ASH	Sulphur
¼" x 65	76.4	0.7	15.0	1.03	15.1	1.04
65 x 0	23.6	0.9	7.0	1.16	7.1	1.17
TOTAL	100.0	--	--	--	13.2	1.07

TABLE III Float/Sink ¼" x 65 Fraction

Spec. Grav.		AIR DRIED BASIS						DRY BASIS			
Sink	Float	Weight%	Moist.	Ash	V.M.	F.C.	Sulphur	ASH	V.M.	F C.	Sulphur
	1.40	75.5	0.8	7.2	33.5	58.5	1.23	7.3	33.8	58.9	1.24
1.40	1.50	11.0	1.0	13.0	30.2	55.8	1.07	13.1	30.5	56.4	1.08
1.50	1.60	4.2	0.7	17.9	28.2	53.2	0.83	18.0	28.4	53.6	0.84
1.60		9.3	--	--	--	--	--	66.5	--	--	-- --
TOTAL		100.0	--	--	--	--	--	13.9	--	--	--

TABLE IV Cumulative 1.60 Float

F.S.I.	Phosphorus (in coal)	DILATATION					
		TEMPERATURE °C			PER CENT		"G" FACTOR
		Initial	Softening	Maximum Dilatation	Maximum Contraction	Maximum Dilatation	
8	0.027						

Lab. No. 8150 Date Jan. 26/77

Client: Warnock Hersey

Sample Identification: 76-1275

Starting Temperature °C: 350

Softening Temperature °C: 359

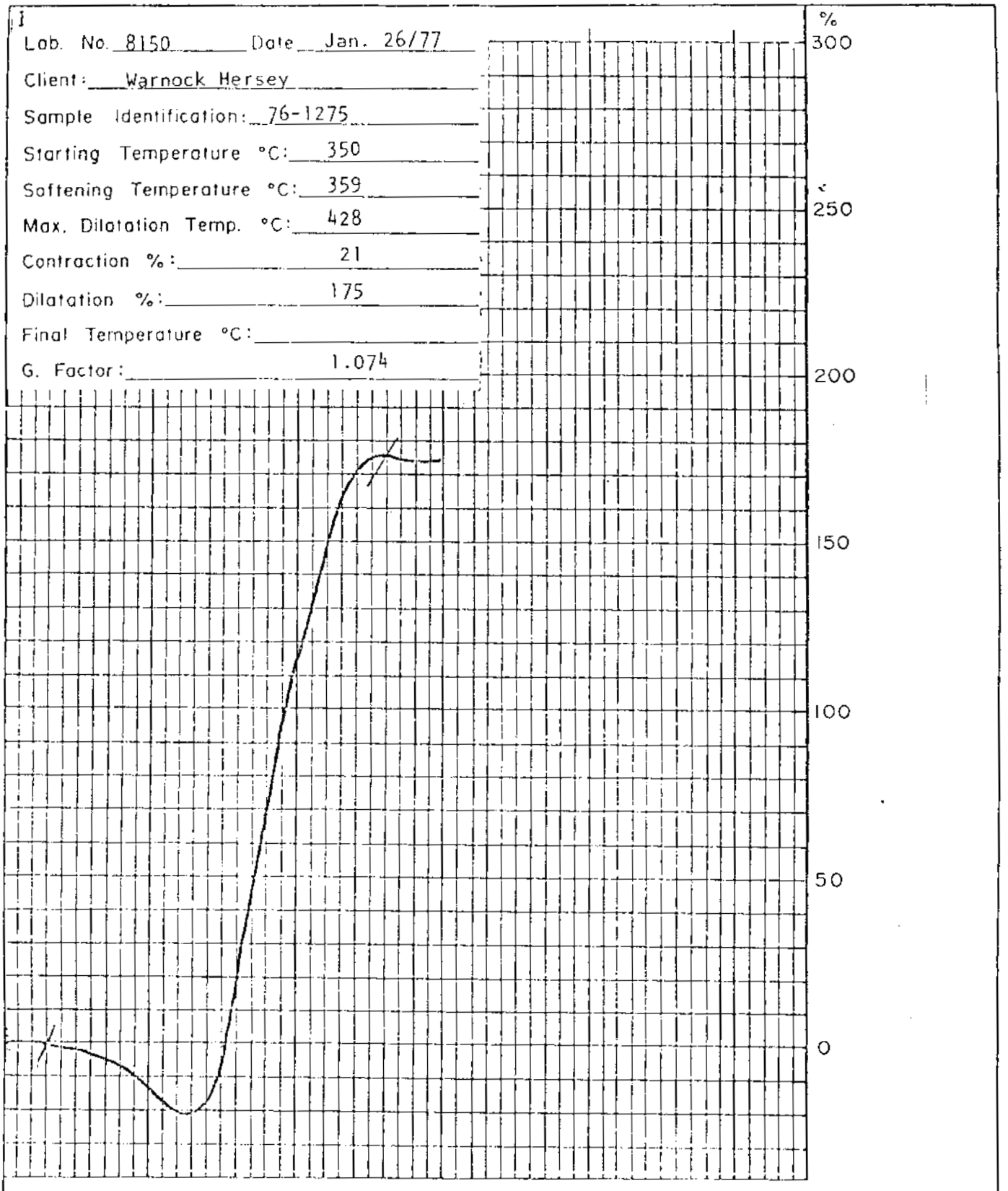
Max. Dilatation Temp. °C: 428

Contraction %: 21

Dilatation %: 175

Final Temperature °C:

G. Factor: 1.074



BIRTLEY ENGINEERING (CANADA) LTD.

Title	Date
RUHR DILATOMETER TEST	
	Drawn

Warnock Hersey Professional Services Ltd.

ELCO MINING LTD.. Elk River Coal Project 1976-77

DRILL CORE ANALYSIS

Sample Identification: DH 34 - 4 Warnock Hersey Lab. No.: 76 - 1276

TABLE I Raw Coal Head Sample ¼" x 0

AIR DRIED BASIS						% DRY BASIS			
Moist.	Ash	V.M.	F. C.	Sulphur	H.G.I.	Ash	V. M.	F.C.	Sulphur
0.8	13.7	29.4	56.1	0.87	90.0	13.8	29.6	56.6	0.88

TABLE II Screen Analysis

	AIR DRIED BASIS				DRY BASIS	
Size	Weight %	Moisture	ASH	Sulphur	ASH	Sulphur
¼" x 65	83.7	0.8	15.1	0.85	15.2	0.86
65 x 0	16.3	0.9	10.3	0.97	10.4	0.98
TOTAL	100.0	--	--	--	14.4	0.88

TABLE III Float/Sink ¼" x 65 Fraction

Spec. Grav.		AIR DRIED BASIS						DRY BASIS			
Sink	Float	Weight%	Moist.	Ash	V.M.	F.C.	Sulphur	ASH	V.M.	F.C.	Sulphur
	1.40	76.3	0.8	3.2	33.1	62.9	0.87	3.2	33.4	63.4	0.88
1.40	1.50	3.9	0.9	8.0	29.6	61.5	0.83	8.1	29.8	62.1	0.84
1.50	1.60	2.2	0.7	12.6	27.8	58.9	0.68	12.7	28.0	59.3	0.68
1.60		17.6	--	--	--	--	--	72.3	--	--	--
TOTAL		100.0	--	--	--	--	--	15.6	--	--	--

TABLE IV Cumulative 1.60 Float

F.S.I.	Phosph-orus (in coal)	DILATATION					
		TEMPERATURE °C			PER CENT		"G" FACTOR
		Initial	Softening	Maximum Dilatation	Maximum Contraction	Maximum Dilatation	
8	0.005	350°C	362°C	428°C	21%	148%	1.067

Lab. No. 8151 Date Jan. 26/77

Client: Warnock Hersey

Sample Identification: 76-1276

Starting Temperature °C: 350

Softening Temperature °C: 362

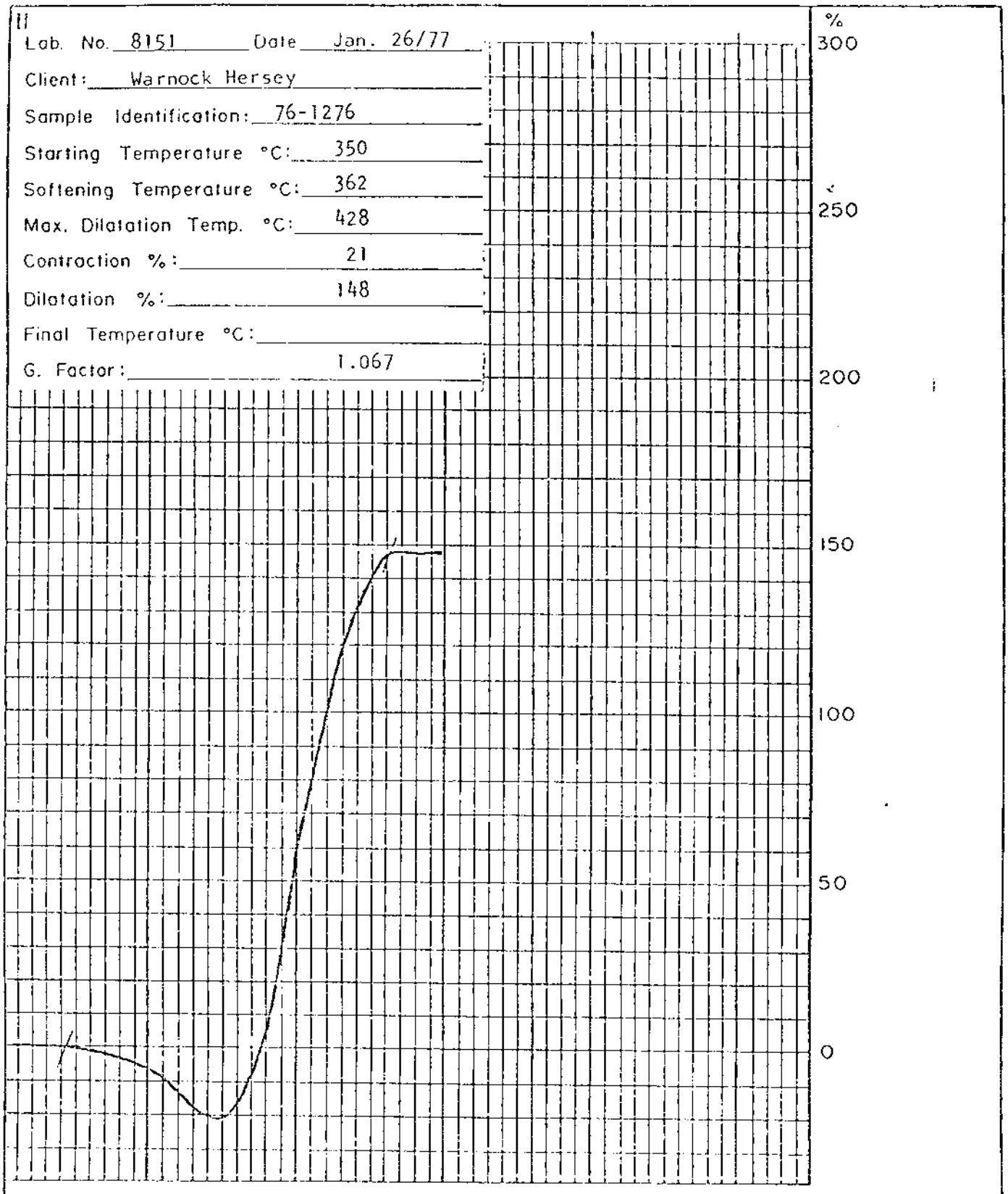
Max. Dilatation Temp. °C: 428

Contraction %: 21

Dilatation %: 148

Final Temperature °C:

G. Factor: 1.067



BIRTLEY ENGINEERING (CANADA) LTD.

Title

RUHR DILATOMETER TEST

Date

Drawn

Warnock Hersey Professional Services Ltd.

ELCO MINING LTD.. Elk River Coal Project 1976-77

DRILL CORE ANALYSIS

Sample Identification: DH 34 - 5 Warnock Hersey Lab. No.: 76 - 1277

TABLE I Raw Coal Head Sample ¼" x 0

AIR DRIED BASIS						% DRY BASIS			
Moist.	Ash	V.M.	F.C.	Sulphur	H.G.I.	Ash	V.M.	F.C.	Sulphur
0.7	40.4	21.1	37.8	0.54	65.0	40.6	21.3	38.1	0.54

TABLE II Screen Analysis

	AIR DRIED BASIS				DRY BASIS	
Size	Weight %	Moisture	ASH	Sulphur	ASH	Sulphur
¼" x 65	84.7	0.7	43.8	0.51	44.1	0.51
65 x 0	15.3	0.8	27.4	0.69	27.6	0.70
TOTAL	100.0	--	--	--	41.6	0.54

TABLE III Float/Sink ¼" x 65 Fraction

Spec. Grav.		AIR DRIED BASIS						DRY BASIS			
Sink	Float	Weight%	Moist.	Ash	V.M.	F.C.	Sulphur	ASH	V.M.	F C.	Sulphur
	1.40	33.3	0.7	6.3	30.6	62.4	0.77	6.3	30.9	62.8	0.78
1.40	1.50	7.1	0.8	18.0	27.4	53.8	0.72	18.2	27.6	54.2	0.73
1.50	1.60	4.0	0.7	27.4	24.4	47.5	0.61	27.6	24.6	47.8	0.61
1.60		55.6	--	--	--	--	--	70.1	--	--	--
TOTAL		100.0	--	--	--	--	--	43.5	--	--	--

TABLE IV Cumulative 1.60 Float

F.S.I.	Phosphorus (in coal)	DILATATION					
		TEMPERATURE °C			PER CENT		"G" FACTOR
		Initial	Softening	Maximum Dilatation	Maximum Contraction	Maximum Dilatation	
7	0.071	350°C	362°C	440°C	20%	147%	1.080

Lab. No. 8152 Date Jan. 26/77

Client: Warnock Hersey

Sample Identification: 76-1277

Starting Temperature °C: 350

Softening Temperature °C: 362

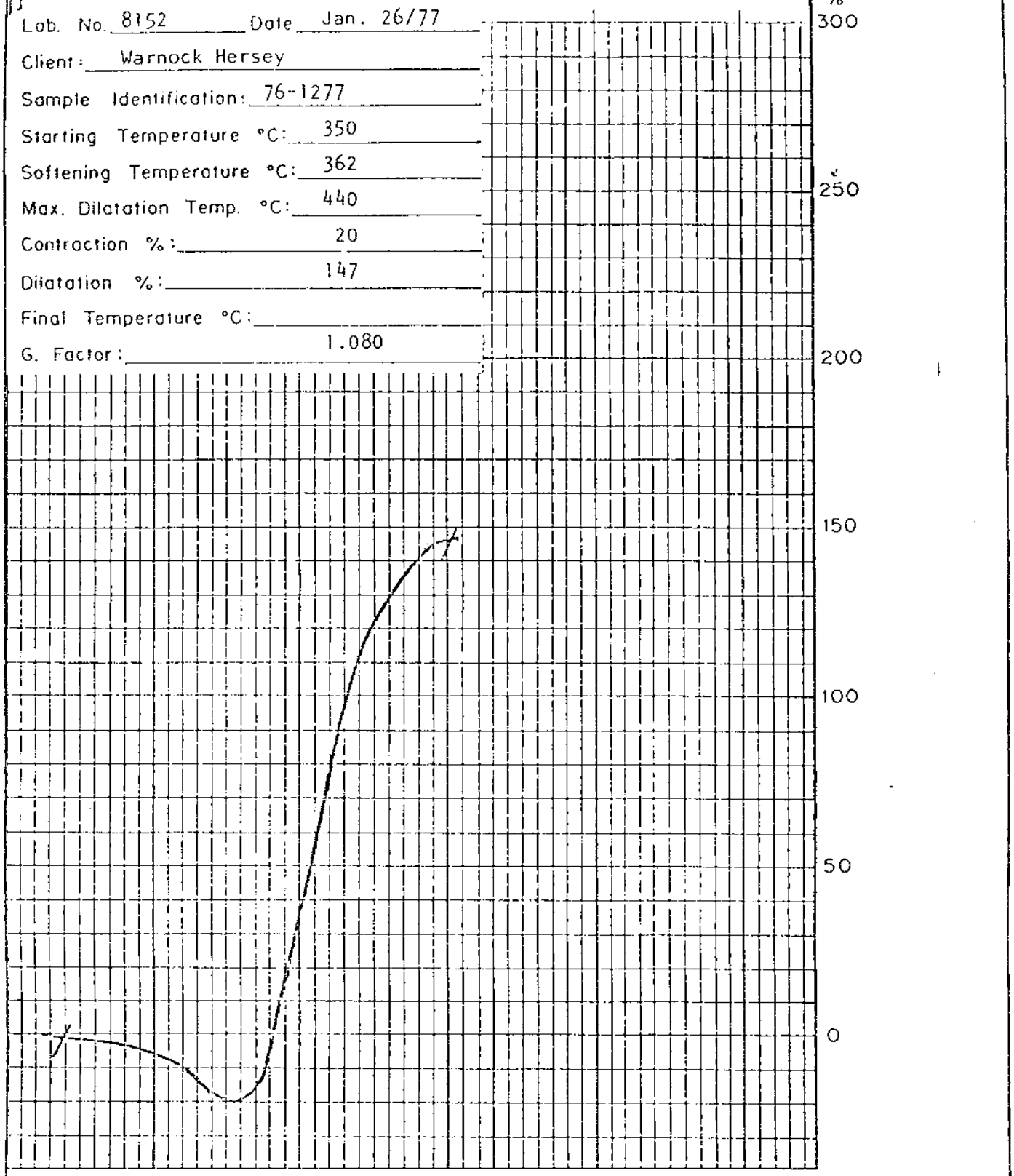
Max. Dilatation Temp. °C: 440

Contraction %: 20

Dilatation %: 147

Final Temperature °C:

G. Factor: 1.080



BIRTLEY ENGINEERING (CANADA) LTD.

Title	Date
RUHR DILATOMETER TEST	
	Drawn

Warnock Hersey Professional Services Ltd.

ELCO MINING LTD.. Elk River Coal Project 1976-77

DRILL CORE ANALYSIS

Sample Identification: DH 34 - 6 Warnock Hersey Lab. No.: 76 - 1278

TABLE I Raw Coal Head Sample ¼" x 0

AIR DRIED BASIS						% DRY BASIS			
Moist.	Ash	V.M.	F. C.	Sulphur	H.G. I.	Ash	V. M.	F.C.	Sulphur
0.8	28.6	24.2	46.4	0.51	110.0	28.9	24.4	46.7	0.51

TABLE II Screen Analysis

	AIR DRIED BASIS				DRY BASIS	
Size	Weight %	Moisture	ASH	Sulphur	ASH	Sulphur
¼" x 65	79.2	0.7	31.2	0.50	31.4	0.50
65 x 0	20.8	0.9	14.5	0.71	14.7	0.72
TOTAL	100.0	--	--	--	27.9	0.54

TABLE III Float/Sink ¼" x 65 Fraction

Spec. Grav.		AIR DRIED BASIS						DRY BASIS			
Sink	Float	Weight%	Moist.	Ash	V.M.	F.C.	Sulphur	ASH	V.M.	F.C.	Sulphur
	1.40	55.6	0.8	4.7	31.5	63.0	0.64	4.7	31.7	63.6	0.65
1.40	1.50	4.1	0.9	16.1	23.8	59.2	0.55	16.2	24.0	59.8	0.56
1.50	1.60	4.0	0.7	22.3	21.7	55.3	0.52	22.5	21.9	55.6	0.52.
1.60		36.3	--	--	--	--	--	73.2	--	--	--
TOTAL		100.0	--	--	--	--	--	30.8	--	--	--

TABLE IV Cumulative 1.60 Float

F.S.I.	Phosph-orus (in coal)	DILATATION					
		TEMPERATURE °C			PER CENT		"G" FACTOR
		Initial	Softening	Maximum Dilatation	Maximum Contraction	Maximum Dilatation	
8½	0.038	350°C	374°C	437°C	14%	188%	1.072

Lab. No. 8153 Date Jan. 26/77

Client: Warnock Hersey

Sample Identification: 76-1278

Starting Temperature °C: 350

Softening Temperature °C: 374

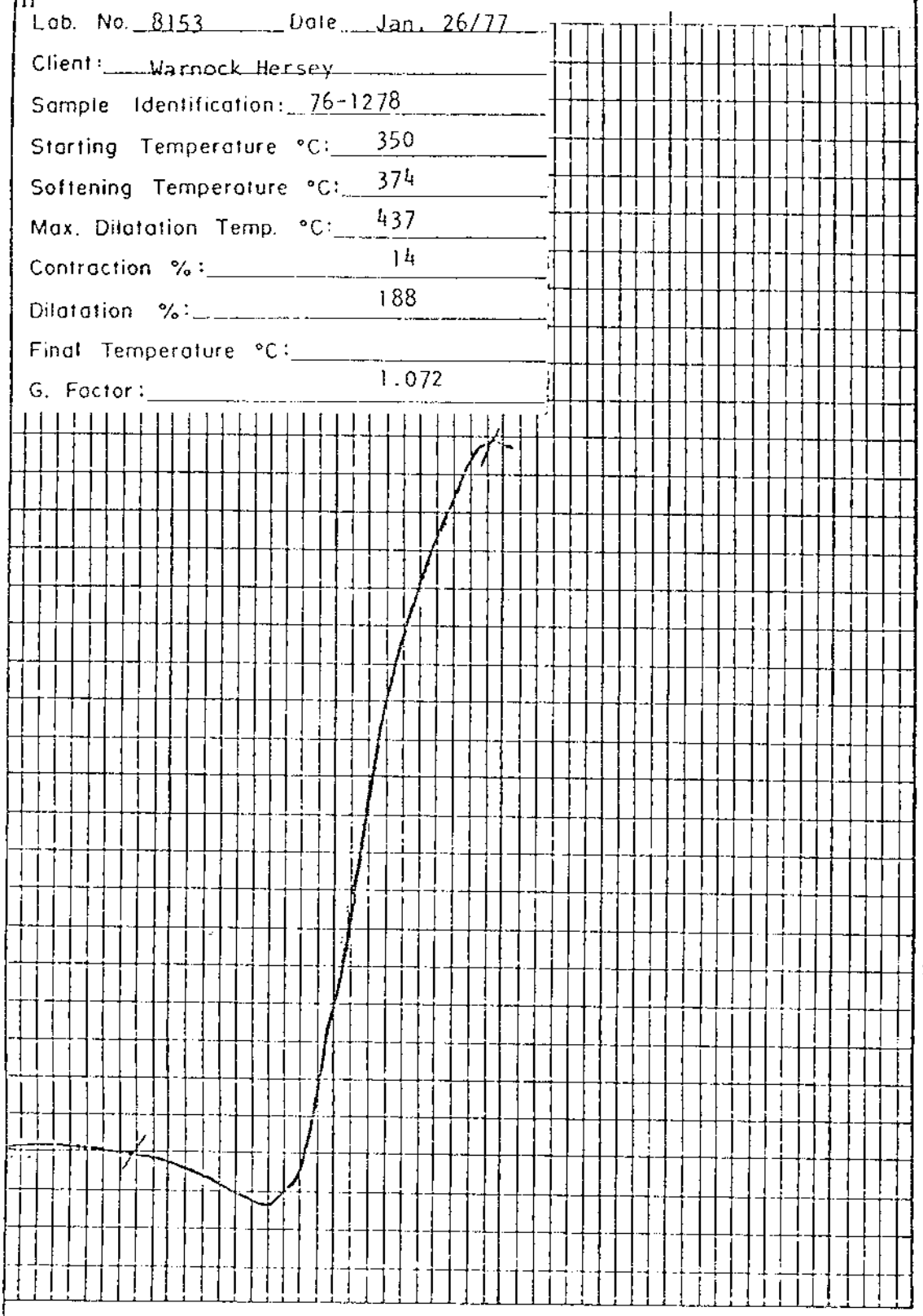
Max. Dilatation Temp. °C: 437

Contraction %: 14

Dilatation %: 188

Final Temperature °C:

G. Factor: 1.072



BIRTLEY ENGINEERING (CANADA) LTD.

Title

RUHR DILATOMETER TEST

Date

Drawn

Warnock Hersey Professional Services Ltd.

ELCO MINING LTD.. Elk River Coal Project 1976-77

DRILL CORE ANALYSIS

Sample Identification: DH 34 - 7 Warnock Hersey Lab. No.: 76 - 1279

TABLE I Raw Coal Head Sample ¼" x 0

AIR DRIED BASIS						% DRY BASIS			
Moist.	Ash	V.M.	F. C.	Sulphur	H.G. I.	Ash	V. M.	F.C.	Sulphur
0.7	20.0	25.7	53.6	0.86	83.0	20.1	25.9	54.0	0.87

TABLE II Screen Analysis

	AIR DRIED BASIS				DRY BASIS	
Size	Weight %	Moisture	ASH	Sulphur	ASH	Sulphur
¼" x 65	86.9	0.7	19.3	0.87	19.4	0.88
65 x 0	13.1	0.8	12.8	1.05	12.9	1.06
TOTAL	100.0	- -	- -	- -	18.5	0.90

TABLE III Float/Sink ¼" x 65 Fraction

Spec. Grav.		AIR DRIED BASIS						DRY BASIS			
Sink	Float	Weight%	Moist.	Ash	V.M.	F.C.	Sulphur	ASH	V.M.	F.C.	Sulphur
	1.40	68.5	0.9	4.6	30.0	64.5	0.93	4.7	30.3	65.0	0.94
1.40	1.50	8.2	0.8	15.4	26.0	57.8	0.75	15.5	26.2	58.3	0.76
1.50	1.60	3.6	0.8	26.7	22.3	50.2	0.62	26.9	22.5	50.6	0.62
1.60		19.7	- -	- -	- -	- -	- -	64.9	- -	- -	- -
TOTAL		100.0	- -	- -	- -	- -	- -	18.2	- -	- -	- -

TABLE IV Cumulative 1.60 Float

F.S.I.	Phosphorus (in coal)	DILATATION					
		TEMPERATURE °C			PER CENT		"G" FACTOR
		Initial	Softening	Maximum Dilatation	Maximum Contraction	Maximum Dilatation	
8½	0.027	350°C	365°C	437°C	22%	180%	1.076

Lab. No. 8154 Date Jan. 26/77

Client: Warnock Hersey

Sample Identification: 76-1279

Starting Temperature °C: 350

Softening Temperature °C: 365

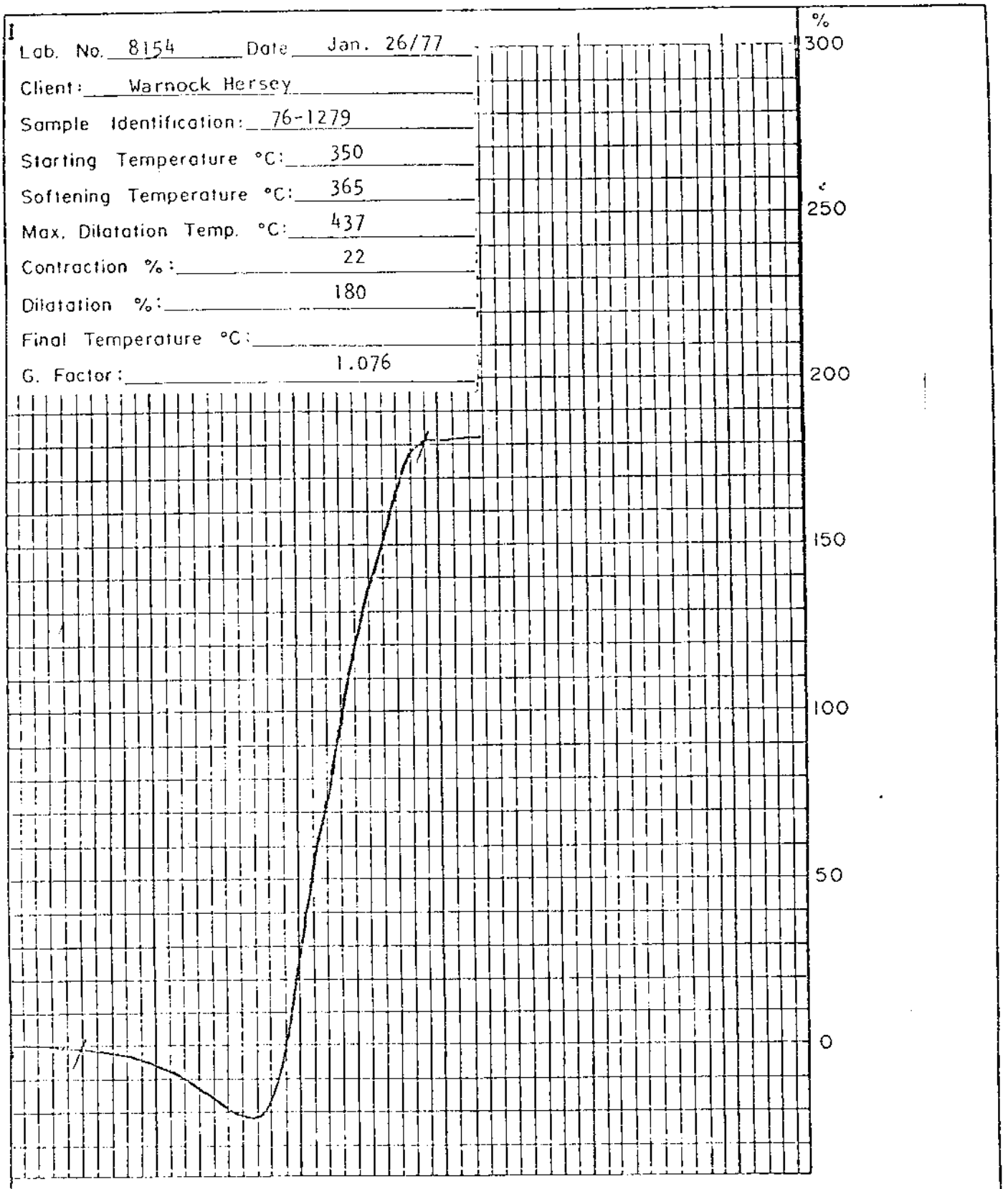
Max. Dilatation Temp. °C: 437

Contraction %: 22

Dilatation %: 180

Final Temperature °C:

G. Factor: 1.076



BIRTLEY ENGINEERING (CANADA) LTD.

Title

RUHR DILATOMETER TEST

Date

Drawn

ELCO MINING LTD.

CORE SAMPLE ANALYSIS

HOLE NO.: DH - 35 - 1 LAB. NO. 8351 DATE: FEB./77

HEAD RAW ANALYSIS						
R.M. %	ASH %	V.M. %	F.C. %	S. %	H.G.I.	REMARKS
5.5	26.6	16.1	51.8	0.36	105	Air Dried Basis
	28.1	17.0	54.9	0.38	---	Dry Basis

SIZE/RAW ANALYSES								
SIZE FRACTION	WT. %	R.M. %	ASH %	S. %	CUMULATIVE WT. %	CUMULATIVE ASH %	CUMULATIVE S. %	
1/4" x 65M	82.2	3.2	28.0	0.35	82.2	28.0	0.35	A.D.B.
	83.2		28.9	0.36	82.3	28.9	0.36	D.B.
65M x 0	17.8	3.8	19.2	0.39	100.0	26.4	0.36	A.D.B.
	17.7		20.0	0.41	100.0	27.3	0.37	D.B.

SINK-FLOAT ANALYSIS: 1/4" x 65M									
S. G.	WT. %	R.M. %	ASH %	V.M. %	F.C. %	S. %	CUMULATIVE WT. %	CUMULATIVE ASH %	
-1.40	22.9	2.8	3.7	20.9	72.6	0.58	22.9	3.7	A.D.B.
	23.0		3.8	21.5	74.7	0.60	23.0	3.8	D.B.
1.40-1.50	27.1	3.7	7.4	18.2	70.7	0.56	50.0	5.7	A.D.B.
	27.0		7.7	18.9	73.4	0.58	50.0	5.9	D.B.
1.50-1.60	13.4	4.2	15.8				63.4	7.8	A.D.B.
	13.2		16.5				63.2	8.1	D.B.
+1.60	36.6	2.8	62.9				100.0	28.0	A.D.B.
	36.8		64.7				100.0	28.9	D.B.

COMPOSITE 1/4" x 65M FLOATS @ 1.50 S.G., A.D.B.						
F.S.I.	P% ON COAL	DILATATION TEST				
		SOFTENING TEMP. (°C)	MAX. DIL. TEMP. (°C)	MAXIMUM CONTR. %	MAXIMUM DIL. %	G. NO.
N.A.	.02	470	---	2% @ 494°	---	---

Birtley Engineering

Subsidiary of Great West Steel Industries

Lab. No. 8351 Date Feb. 22, 1977

Client: ELCO MINING LTD.

Sample Identification: DH-35-1

Starting Temperature °C: 350

Softening Temperature °C: 470

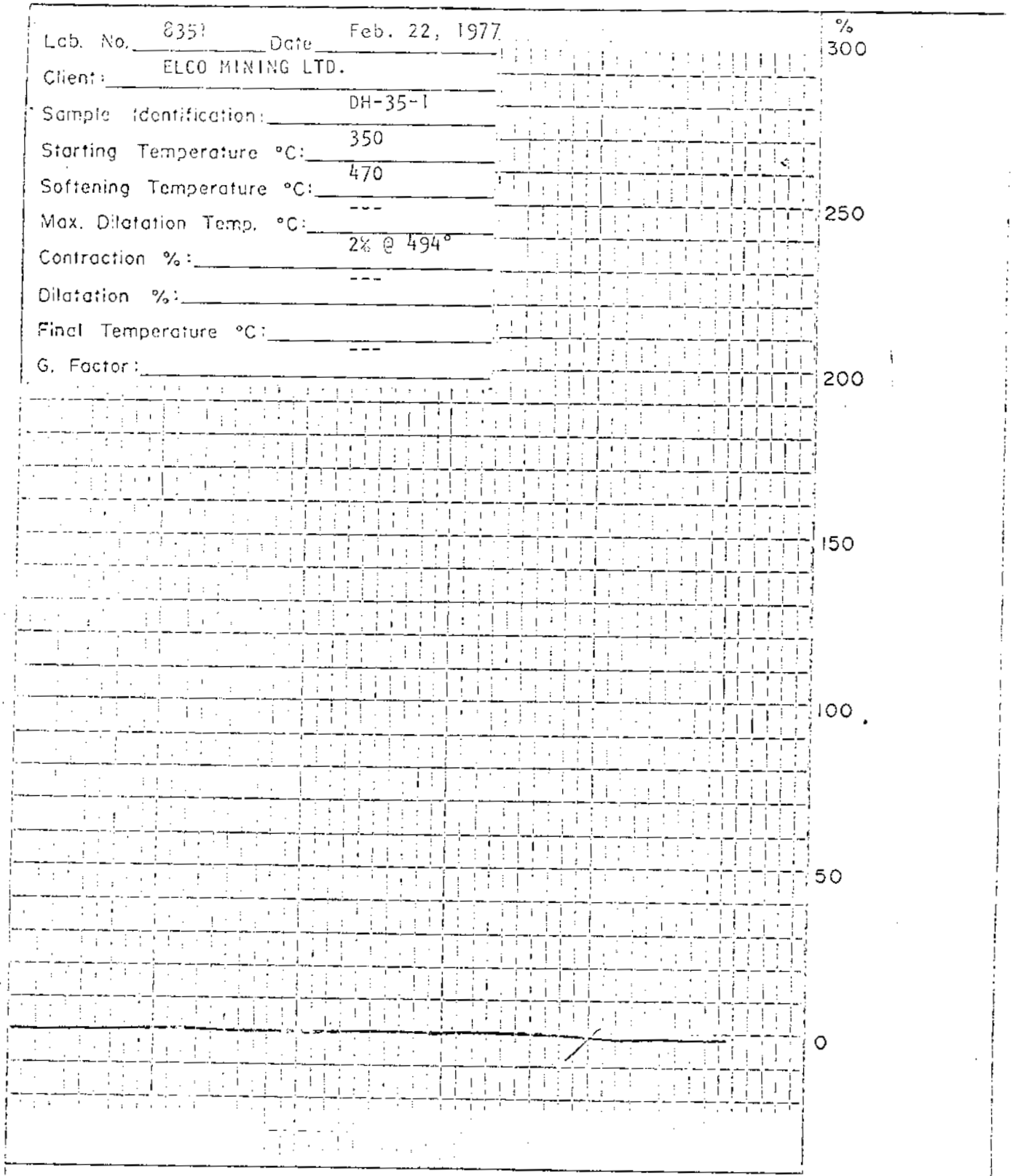
Max. Dilatation Temp. °C: ---

Contraction %: 2% @ 494°

Dilatation %: ---

Final Temperature °C: ---

G. Factor: ---



BIRTLEY ENGINEERING (CANADA) LTD.

Title

RUHR DILATOMETER TEST

Date

Drawn

ELCO MINING LTD.

CORE SAMPLE ANALYSIS

HOLE NO.: DH - 35 - 2 LAB. NO. 8352 DATE: FEB./77

HEAD RAW ANALYSIS						
R.M. %	ASH %	V.M. %	F.C. %	S. %	H.G.I.	REMARKS
1.0	50.5	10.8	37.7	0.38	58	Air Dried Basis
	51.0	10.9	38.1	0.38	--	Dry Basis

SIZE/RAW ANALYSES								
SIZE FRACTION	WT. %	R.M. %	ASH %	S. %	CUMULATIVE WT. %	CUMULATIVE ASH %	CUMULATIVE S. %	
1/4" x 65M	85.6	1.4	51.3	0.34	85.6	51.3	0.34	A.D.B.
	85.6		52.0	0.34	85.6	52.0	0.34	D.B.
65M x 0	14.4	0.9	40.9	0.46	100.0	49.8	0.36	A.D.B.
	14.4		41.3	0.46	100.0	50.5	0.36	D.B.

SINK - FLOAT ANALYSIS: 1/4" x 65M									
S. G.	WT. %	R.M. %	ASH %	V.M. %	F.C. %	S. %	CUMULATIVE WT. %	CUMULATIVE ASH %	
-1.40	26.2	1.0	4.4	15.8	78.8	0.57	26.2	4.4	A.D.B.
	26.3		4.4	16.0	79.6	0.58	26.3	4.4	D.B.
1.40-1.50	7.3	1.0	17.1	14.2	67.7	0.58	33.5	7.1	A.D.B.
	7.4		17.3	14.3	68.4	0.59	33.7	7.2	D.B.
1.50-1.60	4.4	1.9	21.8				37.9	8.9	A.D.B.
	4.4		22.2				38.1	9.0	D.B.
+1.60	62.1	1.5	76.4				100.0	50.8	A.D.B.
	61.9		77.6				100.0	51.4	D.B.

COMPOSITE 1/4" x 65M FLOATS @ 1.50 S.G., A.D.B.						
F.S.I.	P% ON COAL	DILATATION TEST				
		SOFTENING TEMP. (°C)	MAX. DIL. TEMP. (°C)	MAXIMUM CONTR. %	MAXIMUM DIL. %	G. NO.
2	.02	428	---	17% @ 494°	---	---

Birtley Engineering

Subsidiary of Great West Steel Industries

Lab. No. 8352 Date Feb. 22, 1977

Client: ELCO MINING LTD.

Sample Identification: DH-35-2

Starting Temperature °C: 350

Softening Temperature °C: 428

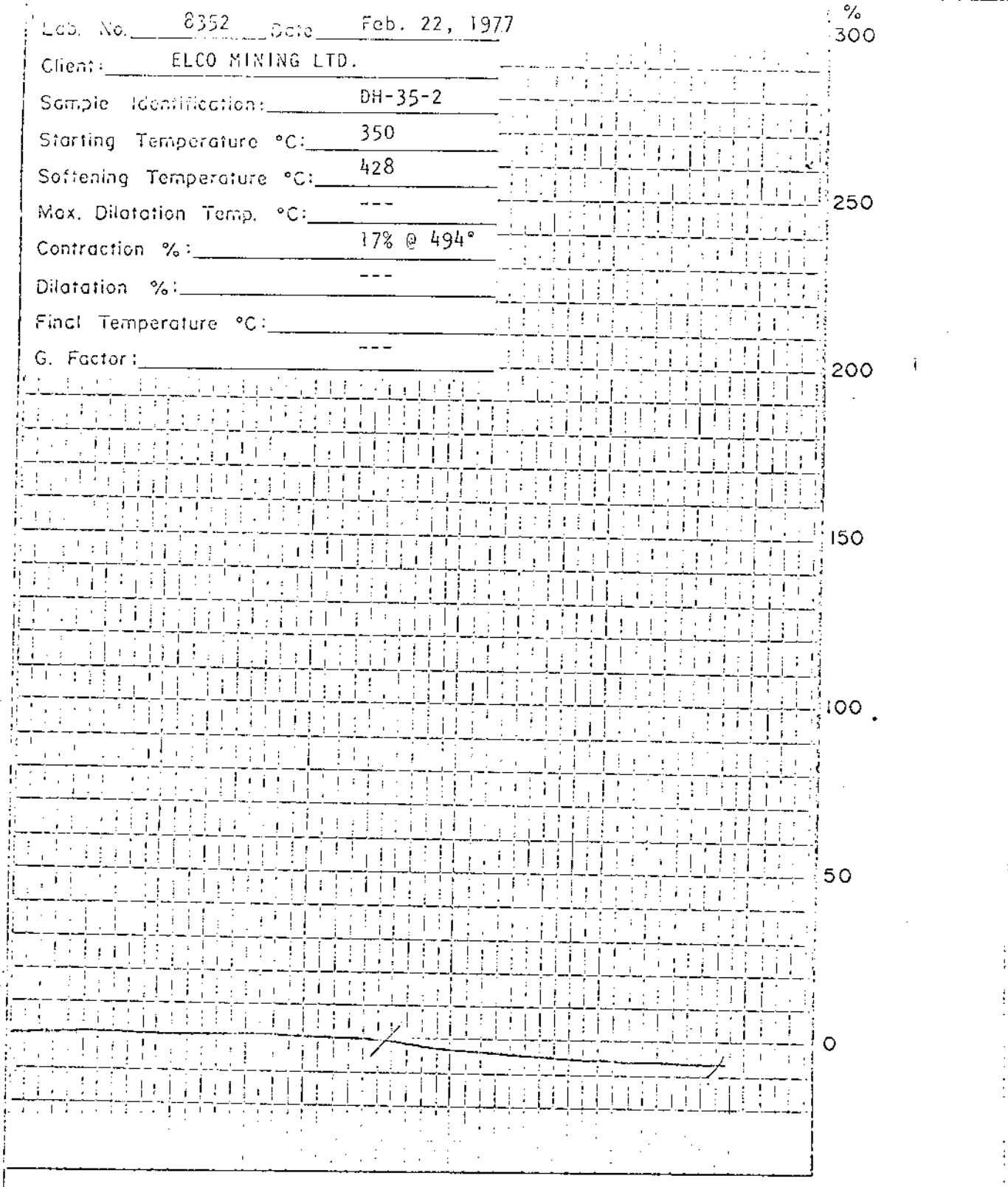
Max. Dilatation Temp. °C: ---

Contraction %: 17% @ 494°

Dilatation %: ---

Final Temperature °C:

G. Factor: ---



BIRTLEY ENGINEERING (CANADA) LTD.

Title

RUHR DILATOMETER TEST

Date

Drawn

ELCO MINING LTD.

CORE SAMPLE ANALYSIS

HOLE NO.: DH - 35 - 3 LAB. NO. 8353 DATE: FEB./77

HEAD RAW ANALYSIS						
R.M. %	ASH %	V.M. %	F.C. %	S. %	H.G.I.	REMARKS
0.9	27.2	17.9	54.0	0.52	101	Air Dried Basis
	27.4	18.1	54.5	0.52	---	Dry Basis

SIZE / RAW ANALYSES								
SIZE FRACTION	WT. %	R.M. %	ASH %	S. %	CUMULATIVE WT. %	CUMULATIVE ASH %	CUMULATIVE S. %	
1/4" x 65M	83.2	1.3	31.0	0.49	83.2	31.0	0.49	A.D.B.
	83.6		31.4	0.50	83.6	31.4	0.50	D.B.
65M x 0	16.8	3.7	11.8	0.56	100.0	27.8	0.50	A.D.B.
	16.4		12.3	0.58	100.0	28.3	0.51	D.B.

SINK - FLOAT ANALYSIS: 1/4" x 65M									
S. G.	WT. %	R.M. %	ASH %	V.M. %	F.C. %	S. %	CUMULATIVE WT. %	CUMULATIVE ASH %	
-1.40	41.4	1.1	4.6	19.2	75.1	0.68	41.4	4.6	A.D.B.
	41.6		4.7	19.4	75.9	0.69	41.6	4.7	D.B.
1.40-1.50	14.2	1.8	12.4	18.1	67.7	0.62	55.6	6.6	A.D.B.
	14.1		12.6	18.4	69.0	0.63	55.7	6.7	D.B.
1.50-1.60	9.4	1.9	20.9				65.0	8.7	A.D.B.
	9.3		21.3				65.0	8.8	D.B.
+1.60	35.0	1.3	72.5				100.0	31.0	A.D.B.
	35.0		73.5				100.0	31.4	D.B.

COMPOSITE 1/4" x 65M FLOATS @ 1.50 S.G., A.D.B.						
F.S.I.	P% ON COAL	DILATATION TEST				
		SOFTENING TEMP. (°C)	MAX. DIL. TEMP. (°C)	MAXIMUM CONTR. %	MAXIMUM DIL. %	G. NO.
6 1/2	.01	410	---	12% @ 456°	---	---

Birtley Engineering

Subsidiary of Great West Steel Industries

Lab. No. 8353 Date Feb. 22, 1977

Client: ELCO MINING LTD.

Sample Identification: DH-35-3

Starting Temperature °C: 350

Softening Temperature °C: 410

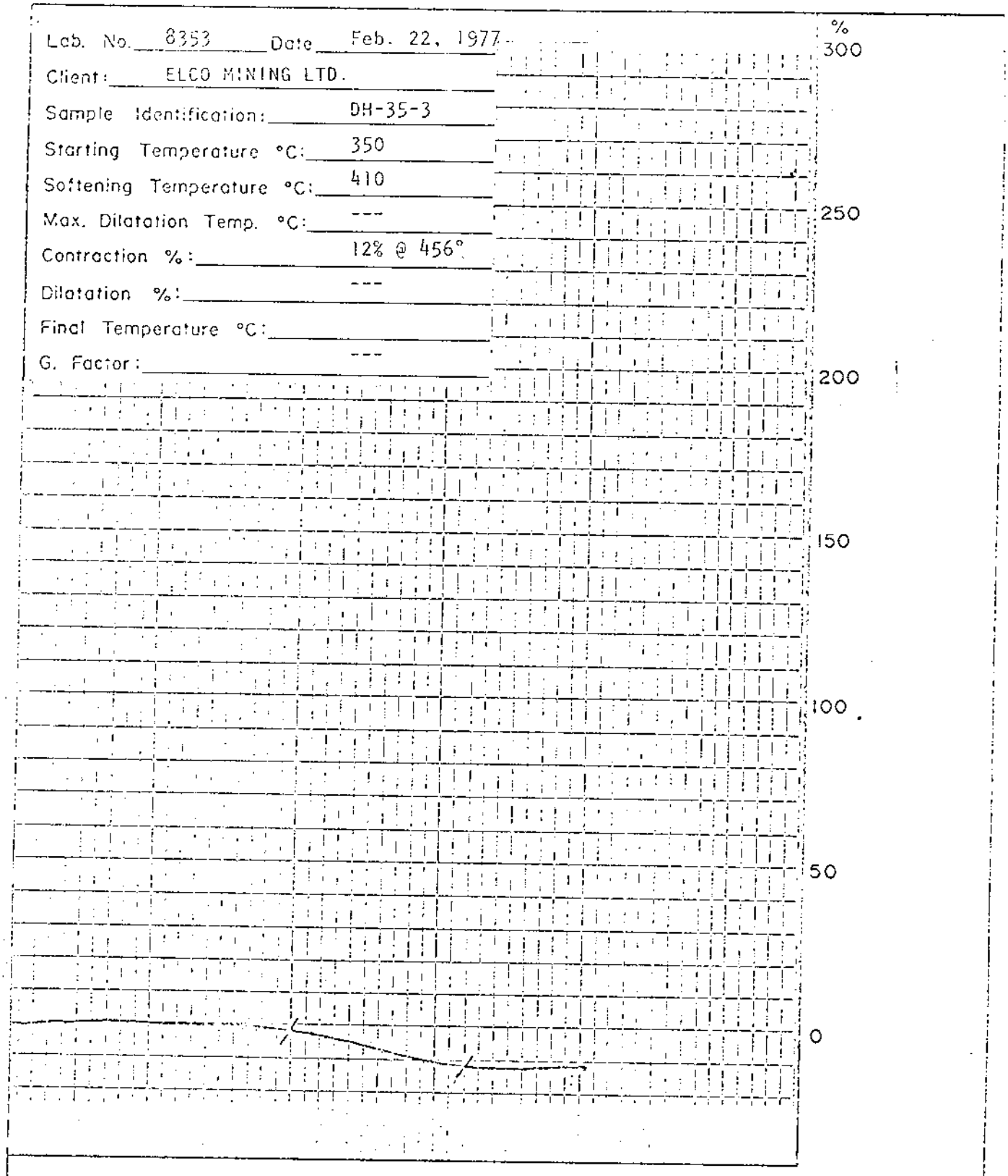
Max. Dilatation Temp. °C: ---

Contraction %: 12% @ 456°

Dilatation %: ---

Final Temperature °C:

G. Factor: ---



BARTLEY ENGINEERING (CANADA) LTD.

Title

RUHR DILATOMETER TEST

Date

Drawn

ELCO MINING LTD.

CORE SAMPLE ANALYSIS

HOLE NO.: DH - 35 - 4 LAB. NO. 8354 DATE: FEB./77

HEAD RAW ANALYSIS						
R.M. %	ASH %	V.M. %	F.C. %	S. %	H.G.I.	REMARKS
0.9	14.1	17.5	67.5	0.55	122	Air Dried Basis
	14.2	17.7	68.1	0.55	---	Dry Basis

SIZE/RAW ANALYSES								
SIZE FRACTION	WT. %	R.M. %	ASH %	S. %	CUMULATIVE WT. %	CUMULATIVE ASH %	CUMULATIVE S. %	
1/4" x 65M	80.1	4.6	14.3	0.54	80.1	14.3	0.54	A.D.B.
	79.5		15.0	0.57	79.5	15.0	0.57	D.B.
65M x 0	19.9	0.8	10.7	0.58	100.0	13.6	0.55	A.D.B.
	20.5		10.8	0.58	100.0	14.1	0.57	D.B.

SINK-FLOAT ANALYSIS: 1/4" x 65M									
S. G.	WT. %	R.M. %	ASH %	V.M. %	F.C. %	S. %	CUMULATIVE WT. %	CUMULATIVE ASH %	
-1.40	73.0	5.6	3.7	19.4	71.3	0.68	73.0	3.7	A.D.B.
	72.3		3.9	20.6	75.5	0.72	72.3	3.9	D.B.
1.40-1.50	10.4	1.5	11.7	17.6	69.2	0.59	83.4	4.7	A.D.B.
	10.7		11.9	17.9	70.2	0.60	83.0	4.9	D.B.
1.50-1.60	3.0	4.2	21.0				86.4	5.3	A.D.B.
	3.0		21.9				86.0	5.5	D.B.
+1.60	13.6	2.0	71.7				100.0	14.3	A.D.B.
	14.0		73.2				100.0	15.0	D.B.

COMPOSITE 1/4" x 65M FLOATS @ 1.50 S.G., A.D.B.						
F.S.I.	P% ON COAL	DILATATION TEST				
		SOFTENING TEMP. (°C)	MAX. DIL. TEMP. (°C)	MAXIMUM CONTR. %	MAXIMUM DIL. %	G. NO.
8 1/2	.05	395	452	16	25	1.015

Birtley Engineering

Subsidiary of Great West Steel Industries

Lab. No. 8354 Date Feb. 22, 1977

Client: ELCO MINING LTD.

Sample Identification: DH-35-4

Starting Temperature °C: 350

Softening Temperature °C: 395

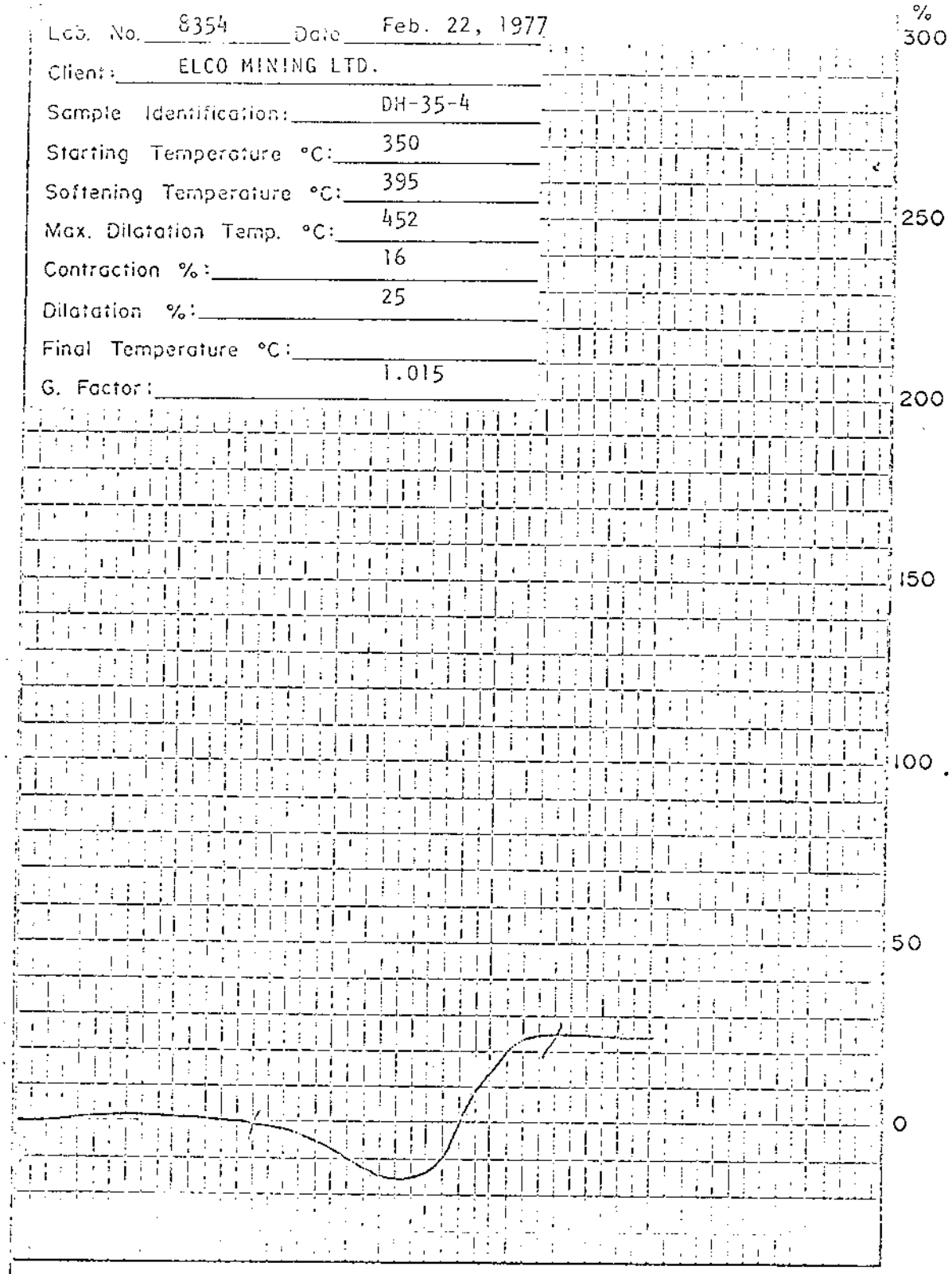
Max. Dilatation Temp. °C: 452

Contraction %: 16

Dilatation %: 25

Final Temperature °C:

G. Factor: 1.015



BARTLEY ENGINEERING (CANADA) LTD.

Title

RUHR DILATOMETER TEST

Date

Drawn

ELCO MINING LTD.

CORE SAMPLE ANALYSIS

HOLE NO.: DH - 35 - 5 LAB. NO. 8355 DATE: FEB./77

HEAD RAW ANALYSIS						
R.M. %	ASH %	V.M. %	F.C. %	S. %	H.G.I.	REMARKS
1.1	19.3	18.2	61.4	0.47	83	Air Dried Basis
	19.5	18.4	62.1	0.48	--	Dry Basis

SIZE / RAW ANALYSES								
SIZE FRACTION	WT. %	R.M. %	ASH %	S. %	CUMULATIVE WT. %	CUMULATIVE ASH %	CUMULATIVE S. %	
1/4" x 65M	84.4	0.6	20.5	0.44	84.4	20.5	0.44	A.D.B.
	84.5		20.6	0.44	84.5	20.6	0.44	D.B.
65M x 0	15.6	1.5	13.4	0.53	100.0	19.4	0.45	A.D.B.
	15.5		13.6	0.54	100.0	19.5	0.45	D.B.

SINK - FLOAT ANALYSIS: 1/4" x 65M									
S. G.	WT. %	R.M. %	ASH %	V.M. %	F.C. %	S. %	CUMULATIVE WT. %	CUMULATIVE ASH %	
-1.40	54.8	1.0	6.8	20.2	72.0	0.54	54.8	6.8	A.D.B.
	54.9		6.9	20.4	72.7	0.55	54.9	6.9	D.B.
1.40-1.50	20.0	1.1	16.1	16.7	66.1	0.43	74.8	9.3	A.D.B.
	20.0		16.3	16.9	66.8	0.43	74.9	9.4	D.B.
1.50-1.60	5.7	1.4	27.0				80.5	10.5	A.D.B.
	5.6		27.4				80.5	10.7	D.B.
+1.60	19.5	1.1	58.8				100.0	20.0	A.D.B.
	19.5		59.5				100.0	20.2	D.B.

COMPOSITE 1/4" x 65M FLOATS @ 1.50 S.G., A.D.B.						
F.S.I.	P% ON COAL	DILATATION TEST SOFTENING TEMP. (°C)	MAX. DIL. TEMP. (°C)	MAXIMUM CONTR. %	MAXIMUM DIL. %	G. NO.
8 1/2	.01	371	422	12	67	1.047

Birtley Engineering

Subsidiary of Great West Steel Industries

Lab. No. 8355 Date Feb. 22, 1977

Client: ELCO MINING LTD.

Sample Identification: DH-35-5

Starting Temperature °C: 350

Softening Temperature °C: 371

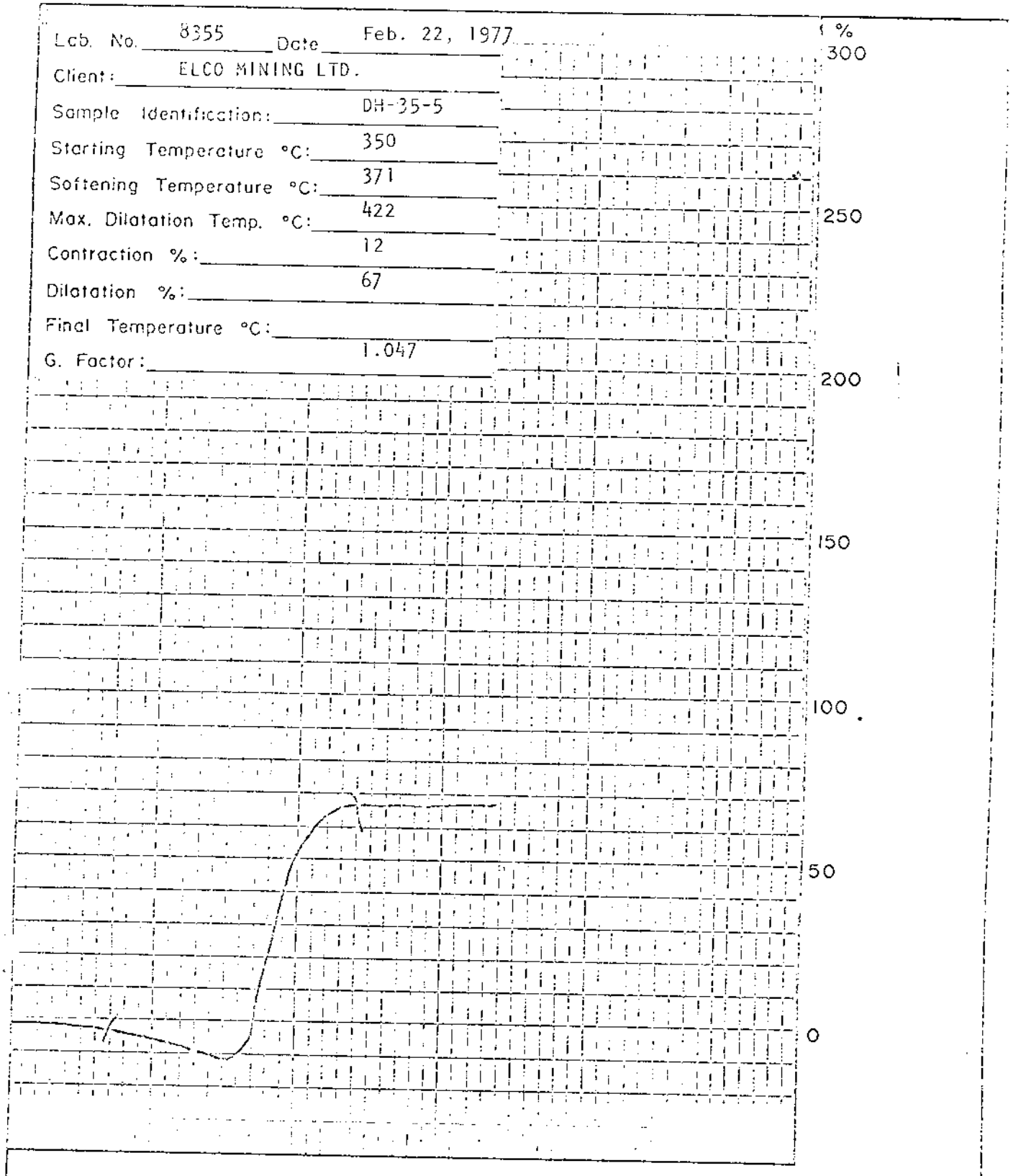
Max. Dilatation Temp. °C: 422

Contraction %: 12

Dilatation %: 67

Final Temperature °C:

G. Factor: 1.047



BIRTLEY ENGINEERING (CANADA) LTD.

Title

RUHR DILATOMETER TEST

Date

Drawn

ELCO MINING LTD.

CORE SAMPLE ANALYSIS

HOLE NO.: DH - 36 - 1 Lab. No. 8429 DATE: Feb./77

HEAD RAW ANALYSIS						
R.M. %	ASH %	V.M. %	F.C. %	S. %	H.G.I.	REMARKS
0.9	35.2	22.5	41.4	0.77	112	Air Dried Basis
	35.5	22.7	41.8	0.78	---	Dry Basis

SIZE/RAW ANALYSES								
SIZE FRACTION	WT. %	R.M. %	ASH %	S. %	CUMULATIVE WT. %	CUMULATIVE ASH %	CUMULATIVE S. %	
1/4" x 65M	83.1	1.1	35.6	0.78	83.1	35.6	0.78	A.D.B.
	83.2		36.0	0.79	83.2	36.0	0.79	D.B.
65M x 0	16.9	1.4	30.5	0.72	100.0	34.7	0.77	A.D.B.
	16.8		30.9	0.73	100.0	35.1	0.78	D.B.

SINK-FLOAT ANALYSIS: 1/4" x 65M									
S. G.	WT. %	R.M. %	ASH %	V.M. %	F.C. %	S. %	CUMULATIVE WT. %	CUMULATIVE ASH %	
-1.40	41.5	4.2	3.1	29.5	63.2	0.84	41.5	3.1	A.D.B.
	41.1		3.2	30.8	66.0	0.88	41.1	3.2	D.B.
1.40-1.50	10.7	3.8	17.6	28.4	50.2	0.83	52.2	6.1	A.D.B.
	10.7		18.3	29.5	52.2	0.86	51.8	6.3	D.B.
1.50-1.60	4.7	4.7	23.0				56.9	7.5	A.D.B.
	4.6		24.1				56.4	7.8	D.B.
+1.60	43.1	2.3	71.5				100.0	35.1	A.D.B.
	43.6		73.2				100.0	36.3	D.B.

COMPOSITE 1/4" x 65M FLOATS @ 1.50 S.G., A.D.B.						
F.S.I.	P% ON COAL	DILATATION TEST SOFTENING TEMP. (°C)	MAX. DIL. TEMP. (°C)	MAXIMUM CONTR. %	MAXIMUM DIL. %	G. NO.
8 1/2	.01	374	425	17	80	1.043

Birtley Engineering

Subsidiary of Great West Steel Industries

Lab. No. [illegible] Date Feb. 23, 1977

Client: ELCO MINING LTD.

Sample Identification: 28-36-1

Starting Temperature °C: 350

Softening Temperature °C: 374

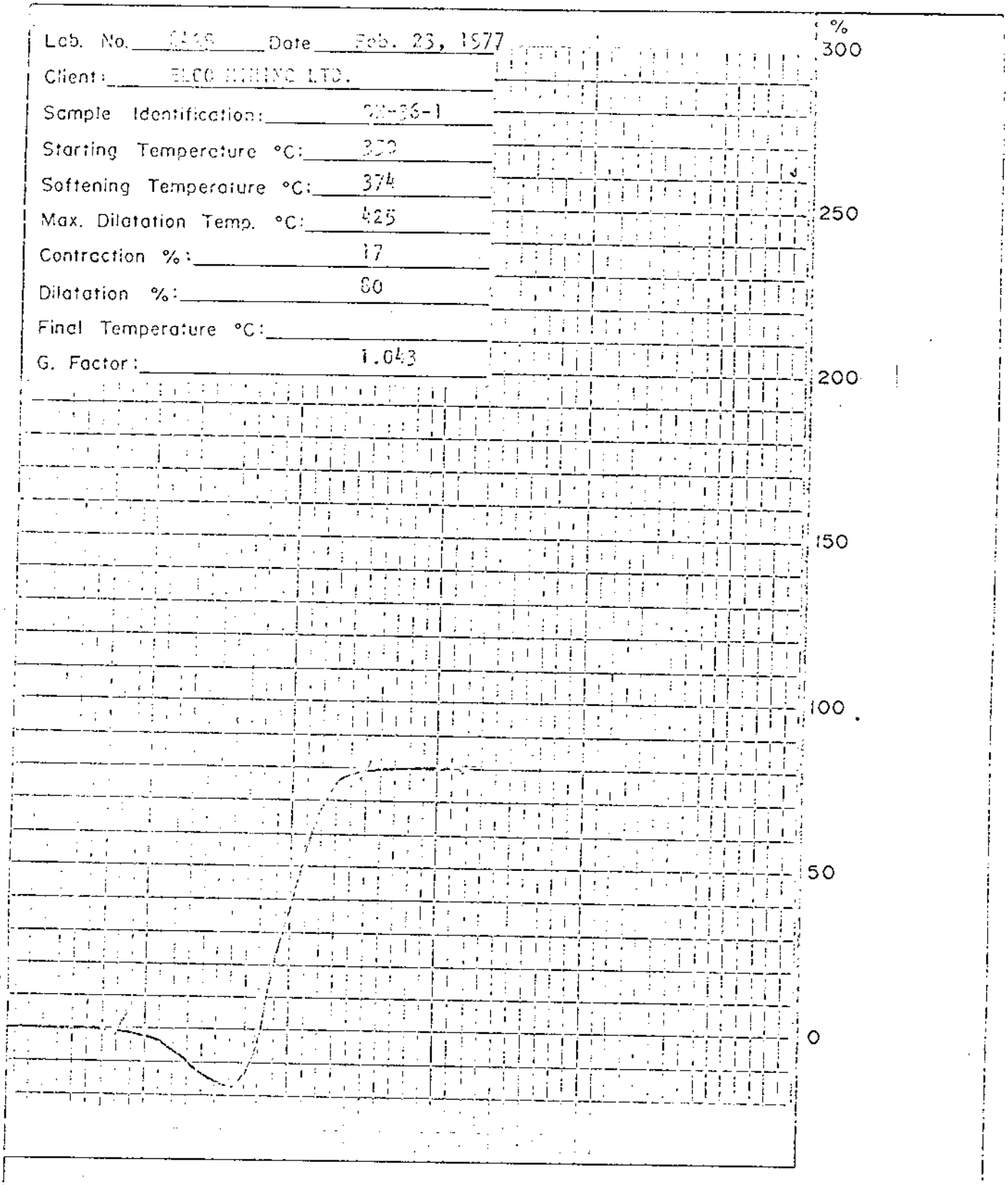
Max. Dilatation Temp. °C: 425

Contraction %: 17

Dilatation %: 80

Final Temperature °C:

G. Factor: 1.043



BIRTLEY ENGINEERING (CANADA) LTD.

Title

RUHR DILATOMETER TEST

Date

Drawn

ELCO MINING LTD.

CORE SAMPLE ANALYSIS

HOLE NO.: DH - 36 - 2 Lab. No. 8430 DATE: Feb./77

HEAD RAW ANALYSIS						
R.M. %	ASH %	V.M. %	F.C. %	S. %	H.G.I.	REMARKS
0.7	47.7	14.0	37.6	0.33	79	Air Dried Basis
	48.0	14.1	37.9	0.33	--	Dry Basis

SIZE / RAW ANALYSES								
SIZE FRACTION	WT. %	R.M. %	ASH %	S. %	CUMULATIVE WT. %	CUMULATIVE ASH %	CUMULATIVE S. %	
1/4" x 65M	77.8	2.0	55.6	0.32	77.8	55.6	0.32	A.D.B.
	77.6		56.7	0.33	77.6	56.7	0.33	D.B.
65M x 0	22.2	0.8	23.5	0.53	100.0	48.5	0.37	A.D.B.
	22.4		23.7	0.53	100.0	49.3	0.37	D.B.

SINK - FLOAT ANALYSIS: 1/4" x 65M									
S. G.	WT. %	R.M. %	ASH %	V.M. %	F.C. %	S. %	CUMULATIVE WT. %	CUMULATIVE ASH %	
-1.40	24.6	2.3	6.2	18.1	73.4	0.61	24.6	6.2	A.D.B.
	24.6		6.3	18.5	75.2	0.62	24.6	6.3	D.B.
1.40-1.50	4.9	2.2	13.2	16.5	68.1	0.53	29.5	7.4	A.D.B.
	4.8		13.5	16.9	69.6	0.54	29.4	7.5	D.B.
1.50-1.60	2.3	1.6	24.8				31.8	8.6	A.D.B.
	2.3		25.2				31.7	8.8	D.B.
+1.60	68.2	1.9	78.2				100.0	56.1	A.D.B.
	68.3		79.7				100.0	57.2	D.B.

COMPOSITE 1/4" x 65M FLOATS @ 1.50 S.G., A.D.B.						
F.S.I.	P% ON COAL	DILATATION TEST				
		SOFTENING TEMP. (°C)	MAX. DIL. TEMP. (°C)	MAXIMUM CONTR. %	MAXIMUM DIL. %	G. NO.
4	.01	437	---	13% @ 445°	---	---

Birtley Engineering

Subsidiary of Great West Steel Industries

Lab. No. 6316 Date Feb. 23, 1977

Client: [illegible]

Sample Identification: DL-30-2

Starting Temperature °C: 300

Softening Temperature °C: 437

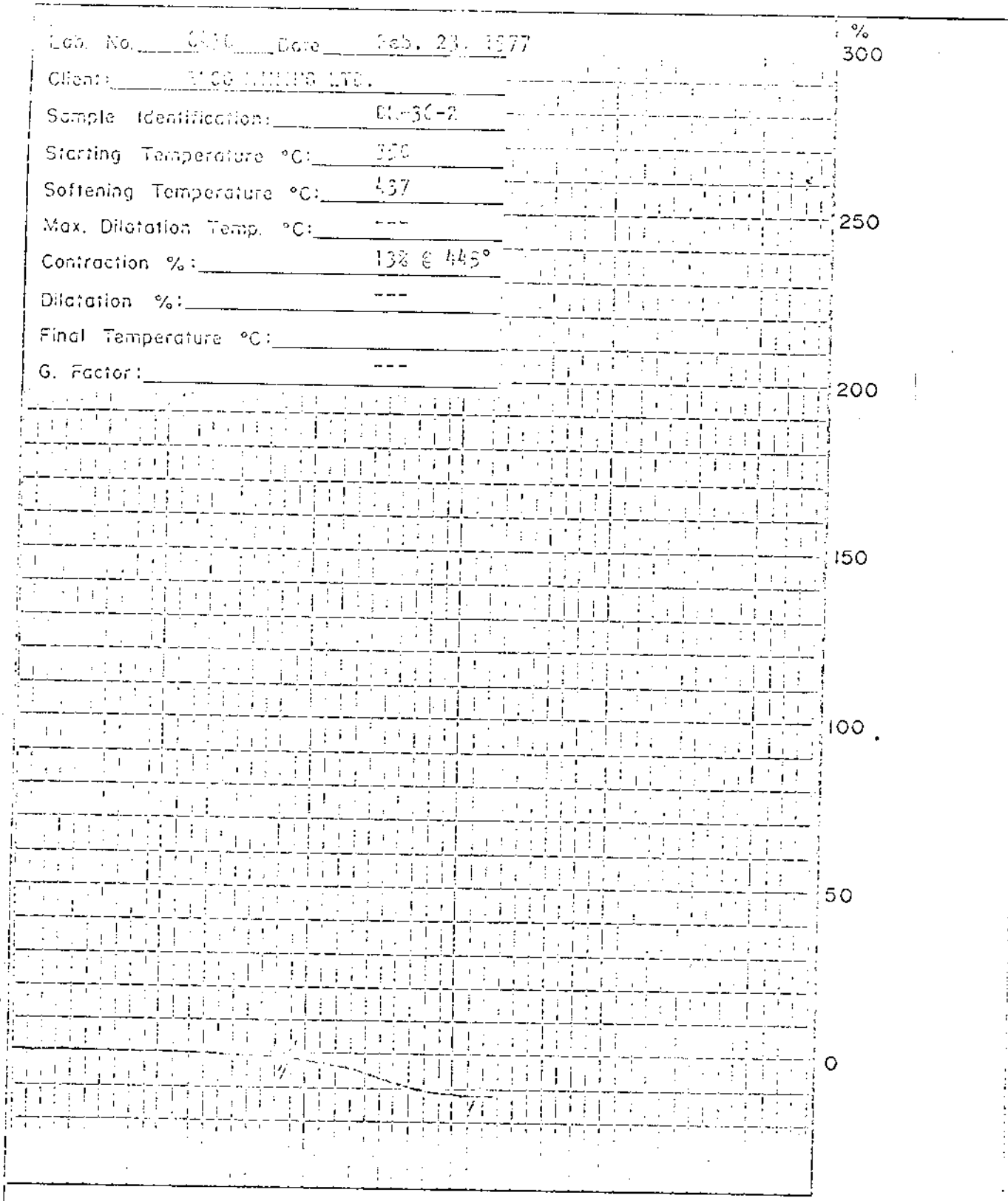
Max. Dilatation Temp. °C: ---

Contraction %: 13% @ 445°

Dilatation %: ---

Final Temperature °C:

G. Factor: ---



BARTLEY ENGINEERING (CANADA) LTD.

Title	Date
RUHR DILATOMETER TEST	
	Drawn

ELCO MINING LTD.

CORE SAMPLE ANALYSIS

HOLE NO.: DH -36 - 3 Lab. No. 8471 DATE: Feb./77

HEAD RAW ANALYSIS						
R.M. %	ASH %	V.M. %	F.C. %	S. %	H.G.I.	REMARKS
0.7	19.0	17.0	63.3	0.60	97	Air Dried Basis
	19.1	17.1	63.8	0.60	--	Dry Basis

SIZE / RAW ANALYSES								
SIZE FRACTION	WT. %	R.M. %	ASH %	S. %	CUMULATIVE WT. %	CUMULATIVE ASH %	CUMULATIVE S. %	
1/4" x 65M	83.4	0.4	19.5	0.52	83.4	19.5	0.52	A.D.B.
	83.5		19.6	0.52	83.5	19.6	0.52	D.B.
65M x 0	16.6	0.8	15.2	0.66	100.0	18.8	0.56	A.D.B.
	16.5		15.3	0.67	100.0	18.9	0.56	D.B.

SINK - FLOAT ANALYSIS: 1/4" x 65M									
S. G.	WT. %	R.M. %	ASH %	V.M. %	F.C. %	S. %	CUMULATIVE WT. %	CUMULATIVE ASH %	
-1.40	61.0	2.7	4.9	19.3	73.1	0.74	61.0	4.9	A.D.B.
	60.8		5.0	19.8	75.2	0.76	60.8	5.0	D.B.
1.40-1.50	14.4	1.1	17.9	15.4	64.6	0.52	75.4	7.4	A.D.B.
	14.6		18.1	16.6	65.3	0.53	75.4	7.5	D.B.
1.50-1.60	6.1	1.5	28.5				81.5	9.0	A.D.B.
	6.1		28.9				81.5	9.1	D.B.
+1.60	18.5	2.0	60.9				100.0	18.6	A.D.B.
	18.5		62.1				100.0	18.9	D.B.

COMPOSITE 1/4" x 65M FLOATS @ 1.50 S.G., A.D.B.						
F.S.I.	P% ON COAL	DILATATION TEST				
		SOFTENING TEMP. (°C)	MAX. DIL. TEMP. (°C)	MAXIMUM CONTR. %	MAXIMUM DIL. %	G. NO.
8	.01	407	452	14	22	1.011

Birtley Engineering

Subsidiary of Great West Steel Industries

Lab. No. 8471 Date Feb. 25, 1977

Client: ELCO MINING LTD.

Sample Identification: DH-36-3

Starting Temperature °C: 350

Softening Temperature °C: 407

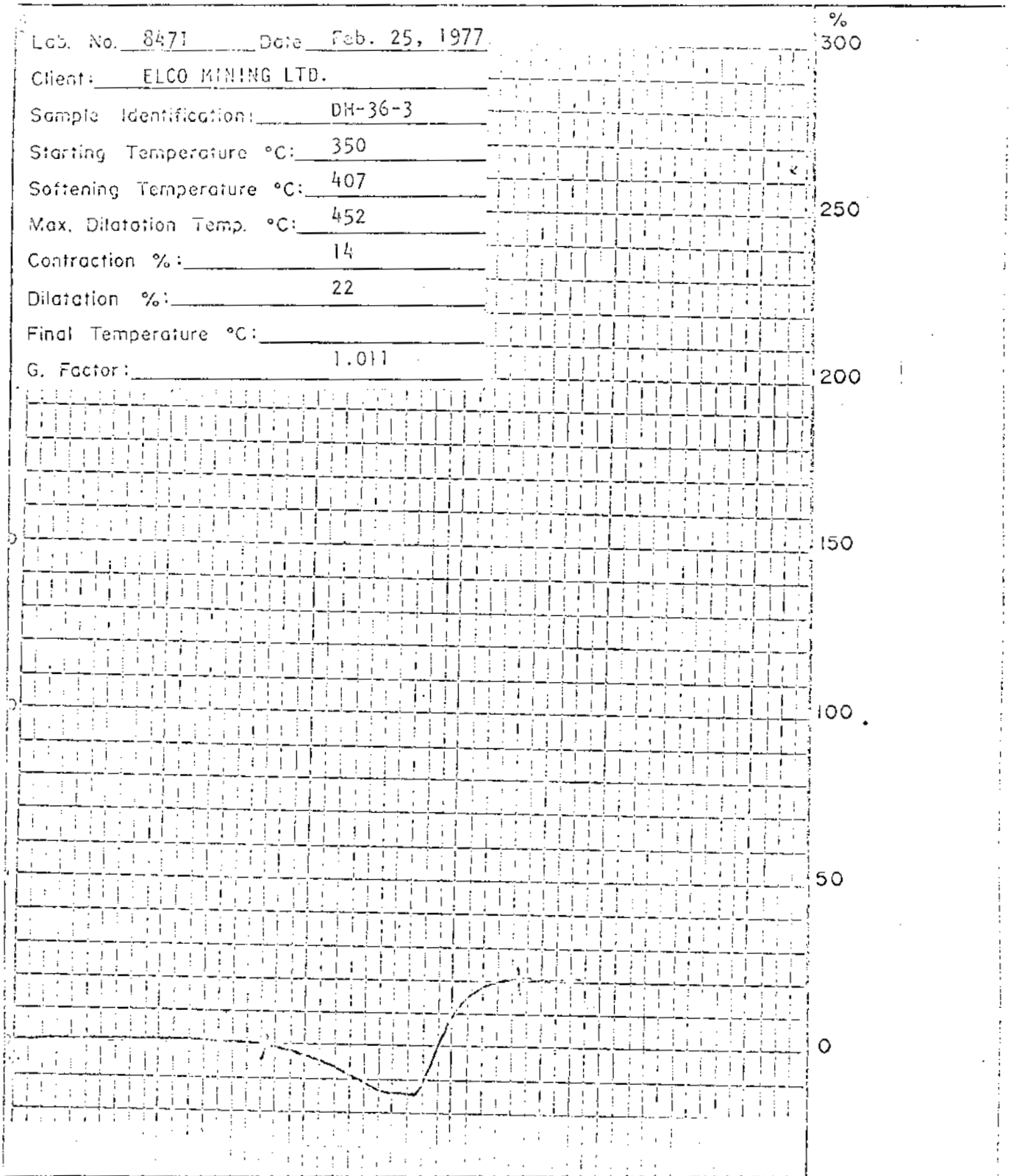
Max. Dilatation Temp. °C: 452

Contraction %: 14

Dilatation %: 22

Final Temperature °C:

G. Factor: 1.011



BARTLEY ENGINEERING (CANADA) LTD.

Title	Date
RUHR DILATOMETER TEST	
	Drawn

ELCO MINING LTD.

CORE SAMPLE ANALYSIS

HOLE NO.: DH - 36 - 4 Lab. No. 8472 DATE: Feb./77

HEAD RAW ANALYSIS						
R.M. %	ASH %	V.M. %	F.C. %	S. %	H.G.I.	REMARKS
0.9	13.5	18.6	67.0	0.64	117	Air Dried Basis
	13.6	18.8	67.6	0.65	---	Dry Basis

SIZE / RAW ANALYSES								
SIZE FRACTION	WT. %	R.M. %	ASH %	S. %	CUMULATIVE WT. %	CUMULATIVE ASH %	CUMULATIVE S. %	
1/4" x 65M	85.9	0.4	13.4	0.66	85.9	13.4	0.66	A.D.B.
	85.9		13.5	0.66	85.9	13.5	0.66	D.B.
65M x 0	14.1	0.7	11.7	0.61	100.0	13.2	0.65	A.D.B.
	14.1		11.8	0.61	100.0	13.3	0.65	D.B.

SINK - FLOAT ANALYSIS: 1/4" x 65M									
S. G.	WT. %	R.M. %	ASH %	V.M. %	F.C. %	S. %	CUMULATIVE WT. %	CUMULATIVE ASH %	
-1.40	75.9	4.4	4.1	19.5	72.0	0.68	75.9	4.1	A.D.B.
	75.5		4.3	20.4	75.3	0.71	75.5	4.3	D.B.
1.40-1.50	8.6	3.2	13.5	16.9	66.4	0.62	84.5	5.1	A.D.B.
	8.7		13.9	17.5	68.6	0.64	84.2	5.3	D.B.
1.50-1.60	1.8	2.9	21.3				86.3	5.4	A.D.B.
	1.8		21.9				86.0	5.6	D.B.
+1.60	13.7	1.8	56.2				100.0	12.4	A.D.B.
	14.0		57.2				100.0	12.9	D.B.

COMPOSITE 1/4" x 65M FLOATS @ 1.50 S.G., A.D.B.						
F.S.I.	P% ON COAL	DILATATION TEST				
		SOFTENING TEMP. (°C)	MAX. DIL. TEMP. (°C)	MAXIMUM CONTR. %	MAXIMUM DIL. %	G. NO.
8	.03	389	440	16	23	1.011

Birtley Engineering

Subsidiary of Great West Steel Industries

Lab. No. 3472 Date Feb. 25, 1977

Client: ELCO MINING LTD.

Sample Identification: DH-36-4

Starting Temperature °C: 350

Softening Temperature °C: 389

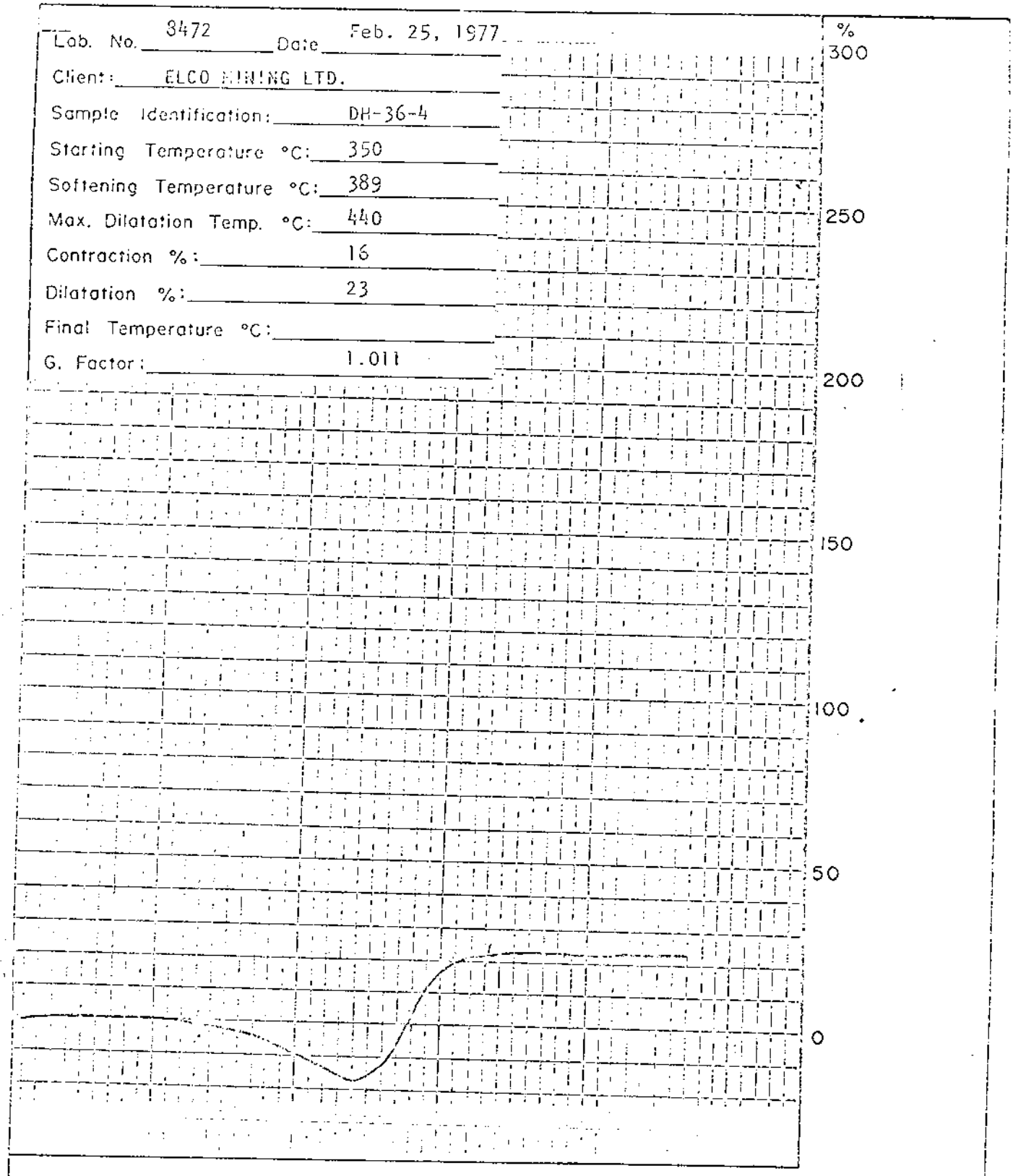
Max. Dilatation Temp. °C: 440

Contraction %: 16

Dilatation %: 23

Final Temperature °C:

G. Factor: 1.011



BIRTLEY ENGINEERING (CANADA) LTD.

Title

RUHR DILATOMETER TEST

Date

Drawn

ELCO MINING LTD.

CORE SAMPLE ANALYSIS

HOLE NO.: DH - 36 - 5 Lab. No. 8473 DATE: Feb./77

HEAD RAW ANALYSIS						
R.M. %	ASH %	V.M. %	F.C. %	S. %	H.G.I.	REMARKS
0.6	20.3	18.2	60.9	0.48	95	Air Dried Basis
	20.4	18.3	61.3	0.48	--	Dry Basis

SIZE/RAW ANALYSES								
SIZE FRACTION	WT. %	R.M. %	ASH %	S. %	CUMULATIVE WT. %	CUMULATIVE ASH %	CUMULATIVE S. %	
1/4" x 65M	86.4	1.3	20.8	0.53	86.4	20.8	0.53	A.D.B.
	86.3		21.1	0.54	86.3	21.1	0.54	D.B.
65M x 0	13.6	0.7	15.2	0.63	100.0	20.0	0.54	A.D.B.
	13.7		15.3	0.63	100.0	20.3	0.55	D.B.

SINK-FLOAT ANALYSIS: 1/4" x 65M									
S. G.	WT. %	R.M. %	ASH %	V.M. %	F.C. %	S. %	CUMULATIVE WT. %	CUMULATIVE ASH %	
-1.40	60.2	1.4	5.8	19.2	73.6	0.68	60.2	5.8	A.D.B.
	60.2		5.9	19.5	74.6	0.69	60.2	5.9	D.B.
1.40-1.50	15.3	1.1	17.1	16.3	65.5	0.45	75.5	8.1	A.D.B.
	15.3		17.3	16.5	66.2	0.46	75.5	8.2	D.B.
1.50-1.60	5.2	1.2	26.7				80.7	9.3	A.D.B.
	5.2		27.0				80.7	9.4	D.B.
+1.60	19.3	1.3	66.5				100.0	20.3	A.D.B.
	19.3		67.4				100.0	20.6	D.B.

COMPOSITE 1/4" x 65M FLOATS @ 1.50 S.G., A.D.B.						
F.S.I.	P% ON COAL	DILATATION TEST				
		SOFTENING TEMP. (°C)	MAX. DIL. TEMP. (°C)	MAXIMUM CONTR. %	MAXIMUM DIL. %	G. NO.
8 1/2	.02	392	449	18	60	1.037

Birtley Engineering

Subsidiary of Great West Steel Industries

Lab. No. 8473 Date Feb. 25, 1977

Client: ELCO MINING LTD.

Sample Identification: DH-36-5

Starting Temperature °C: 350

Softening Temperature °C: 392

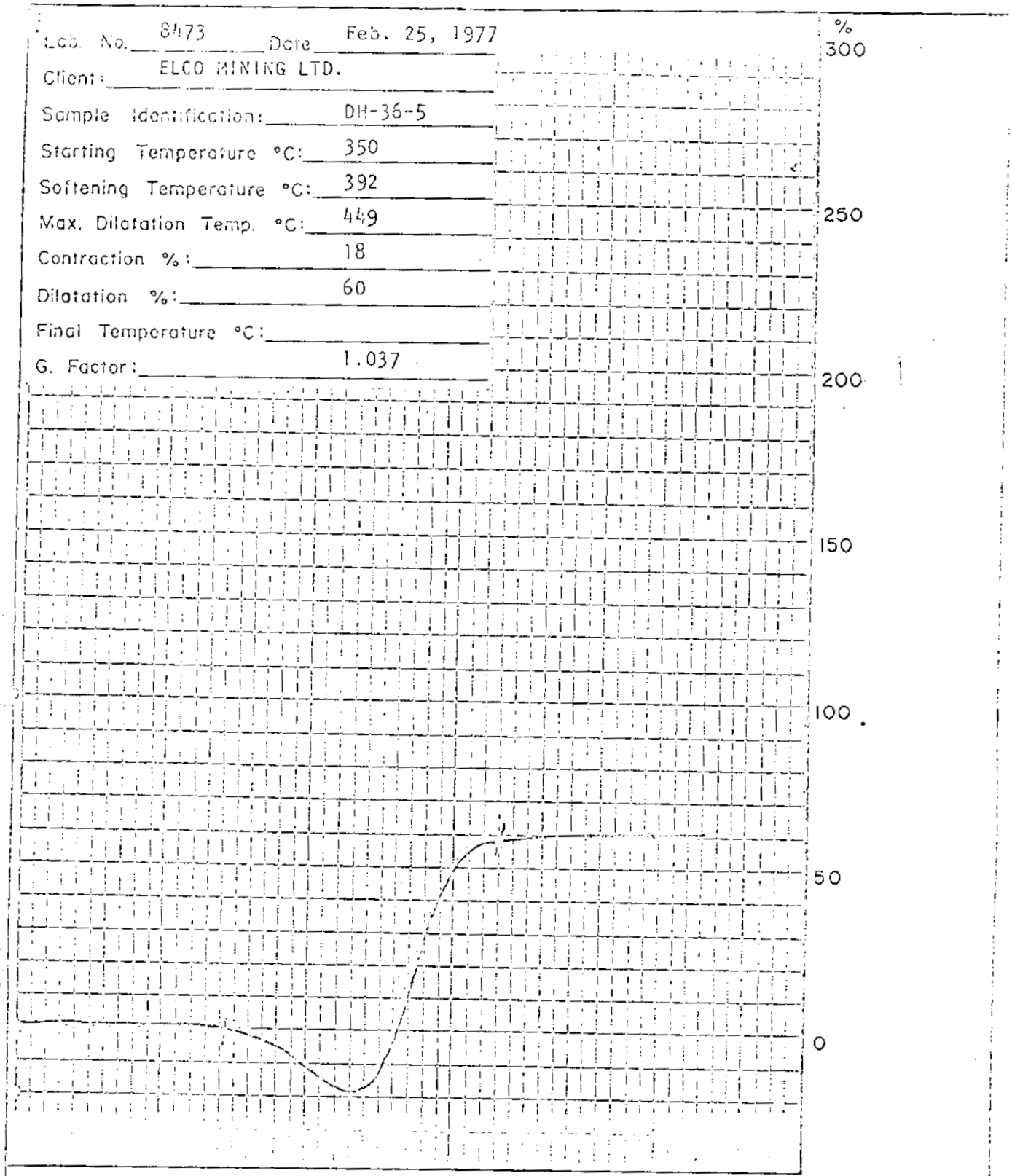
Max. Dilatation Temp. °C: 449

Contraction %: 18

Dilatation %: 60

Final Temperature °C:

G. Factor: 1.037



BARTLEY ENGINEERING (CANADA) LTD.

Title	Date
RUHR DILATOMETER TEST	
	Drawn

ELCO MINING LTD.

CORE SAMPLE ANALYSIS

HOLE NO.: DH - 37 - 1 Lab. No. 8474 DATE: Feb./77

HEAD RAW ANALYSIS						
R.M. %	ASH %	V.M. %	F.C. %	S. %	H.G.I.	REMARKS
0.7	12.5	18.7	68.1	0.54	99	Air Dried Basis
	12.6	18.8	68.6	0.54	--	Dry Basis

SIZE/RAW ANALYSES								
SIZE FRACTION	WT. %	R.M. %	ASH %	S. %	CUMULATIVE WT. %	CUMULATIVE ASH %	CUMULATIVE S. %	
1/4" x 65M	92.8	0.6	12.1	0.66	92.8	12.1	0.66	A.D.B.
	92.8		12.2	0.66	92.8	12.2	0.66	D.B.
65M x 0	7.2	0.8	8.7	0.72	100.0	11.9	0.66	A.D.B.
	7.2		8.8	0.73	100.0	12.0	0.66	D.B.

SINK-FLOAT ANALYSIS: 1/4" x 65M									
S. G.	WT. %	R.M. %	ASH %	V.M. %	F.C. %	S. %	CUMULATIVE WT. %	CUMULATIVE ASH %	
-1.40	69.8	3.5	4.8	19.7	72.0	0.70	69.8	4.8	A.D.B.
	69.4		5.0	20.4	74.6	0.72	69.4	5.0	D.B.
1.40-1.50	17.4	1.1	17.1	16.2	65.6	0.62	87.2	7.3	A.D.B.
	17.7		17.3	16.4	66.3	0.63	87.1	7.5	D.B.
1.50-1.60	5.2	1.5	25.1				92.4	8.3	A.D.B.
	5.3		25.5				82.4	8.5	D.B.
+1.60	7.6	1.9	47.4				100.0	11.2	A.D.B.
	7.6		48.3				100.0	11.6	D.B.

COMPOSITE 1/4" x 65M FLOATS @ 1.50 S.G., A.D.B.							
F.S.I.	P.S. ON COAL	DILATATION TEST					
		SOFTENING TEMP. (°C)	MAX. DIL. TEMP. (°C)	MAXIMUM CONTR. %	MAXIMUM DIL. %	G. NO.	
7	.11	403	--	13% @ 435°	--	--	

Birtley Engineering

Subsidiary of Great West Steel Industries

Lab. No. 8474 Date Feb. 25, 1977

Client: ELCO MINING LTD.

Sample Identification: DH-37-1

Starting Temperature °C: 350

Softening Temperature °C: 403

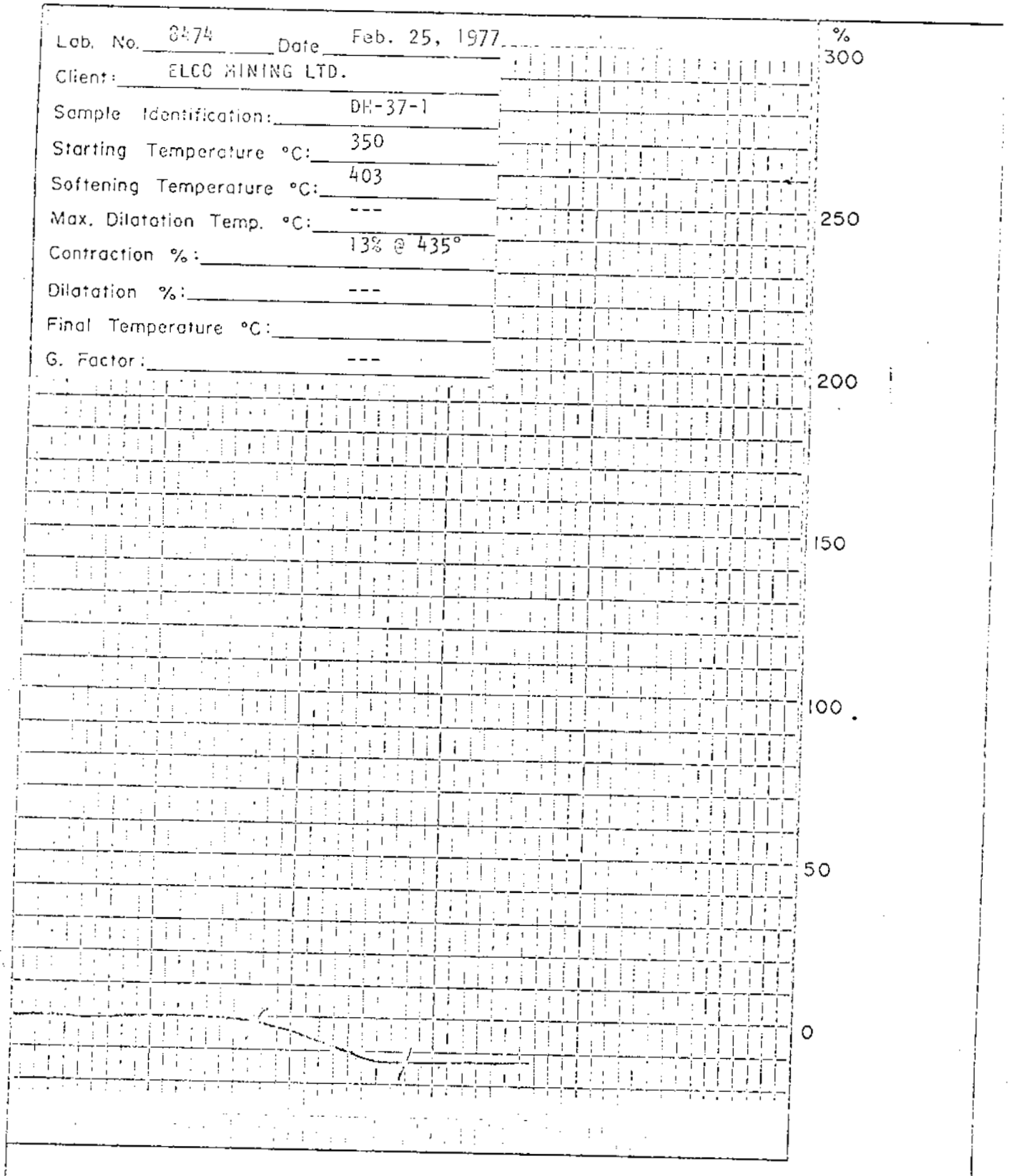
Max. Dilatation Temp. °C: ---

Contraction %: 13% @ 435°

Dilatation %: ---

Final Temperature °C:

G. Factor: ---



BIRTLEY ENGINEERING (CANADA) LTD.

Title

RUHR DILATOMETER TEST

Date

Drawn

ELCO MINING LTD.

CORE SAMPLE ANALYSIS

HOLE NO.: DH - 37 - 2 Lab. No. 8475 DATE: Feb./77

HEAD RAW ANALYSIS						
R.M. %	ASH %	V.M. %	F.C. %	S. %	H.G.I.	REMARKS
0.7	23.2	16.5	59.6	0.48	79	Air Dried Basis
	23.4	16.6	60.0	0.48	--	Dry Basis

SIZE/RAW ANALYSES								
SIZE FRACTION	WT. %	R.M. %	ASH %	S. %	CUMULATIVE WT. %	CUMULATIVE ASH %	CUMULATIVE S. %	
1/4" x 65M	93.2	0.8	22.6	0.47	93.2	22.6	0.47	A.D.B.
	93.2		22.8	0.47	93.2	22.8	0.47	D.B.
65M x 0	6.8	0.9	20.9	0.54	100.0	22.5	0.47	A.D.B.
	6.8		21.1	0.54	100.0	22.7	0.47	D.B.

SINK-FLOAT ANALYSIS: 1/4" x 65M									
S. G.	WT. %	R.M. %	ASH %	V.M. %	F.C. %	S. %	CUMULATIVE WT. %	CUMULATIVE ASH %	
-1.40	62.4	1.0	6.9	17.6	74.5	0.59	62.4	6.9	A.D.B.
	62.5		7.0	17.8	75.2	0.60	62.5	7.0	D.B.
1.40-1.50	10.1	0.8	16.7	16.3	66.2	0.56	72.5	8.3	A.D.B.
	10.1		16.8	16.4	66.8	0.56	72.6	8.4	D.B.
1.50-1.60	5.3	1.1	25.3				77.8	9.4	A.D.B.
	5.3		25.6				77.9	9.5	D.B.
+1.60	22.2	1.6	64.6				100.0	21.7	A.D.B.
	22.1		65.7				100.0	21.9	D.B.

COMPOSITE 1/4" x 65M FLOATS @ 1.50 S.G., A.D.B.							
F.S.I.	P% ON COAL	DILATATION TEST					
		SOFTENING TEMP. (°C)	MAX. DIL. TEMP. (°C)	MAXIMUM CONTR. %	MAXIMUM DIL. %	G. NO.	
4	.03	434	--	24% @ 434°	--	--	

Birtley Engineering

Subsidiary of Great West Steel Industries

Lab. No. 8475 Date Feb. 28, 1977

Client: ELCO MINING LTD.

Sample Identification: DH-37-2

Starting Temperature °C: 350

Softening Temperature °C: 434

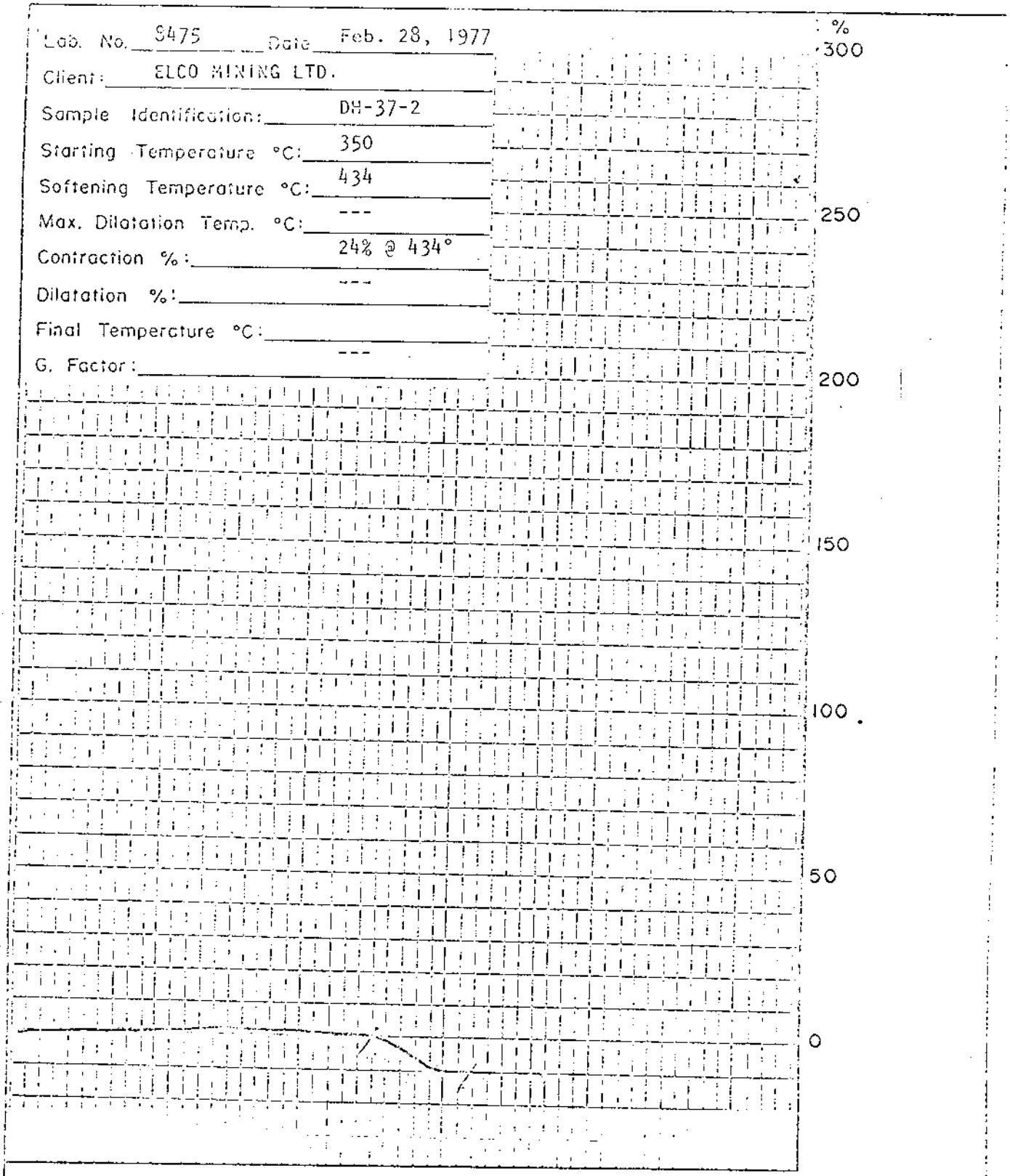
Max. Dilatation Temp. °C: ---

Contraction %: 24% @ 434°

Dilatation %: ---

Final Temperature °C: ---

G. Factor: ---



BARTLEY ENGINEERING (CANADA) LTD.

Title

RUHR DILATOMETER TEST

Date

Drawn

ELCO MINING LTD.

CORE SAMPLE ANALYSIS

HOLE NO.: DH - 37 - 3 Lab. No. 8476 DATE: Feb./77

HEAD RAW ANALYSIS						
R.M. %	ASH %	V.M. %	F.C. %	S. %	H.G.I.	REMARKS.
0.7	47.7	12.5	39.1	0.46	75	Air Dried Basis
	48.0	12.6	39.4	0.46	--	Dry Basis

SIZE / RAW ANALYSES								
SIZE FRACTION	WT. %	R.M. %	ASH %	S. %	CUMULATIVE WT. %	CUMULATIVE ASH %	CUMULATIVE S. %	
1/4" x 65M	92.1	1.6	48.6	0.48	92.1	48.6	0.48	A.D.B.
	92.1		49.4	0.49	92.1	49.4	0.49	D.B.
65M x 0	7.9	0.7	26.0	0.68	100.0	46.8	0.50	A.D.B.
	7.9		26.2	0.68	100.0	47.6	0.50	D.B.

SINK - FLOAT ANALYSIS: 1/4" x 65M									
S. G.	WT. %	R.M. %	ASH %	V.M. %	F.C. %	S. %	CUMULATIVE WT. %	CUMULATIVE ASH %	
-1.40	30.0	1.8	6.0	19.0	73.2	0.74	30.0	6.0	A.D.B.
	29.9		6.1	19.3	74.6	0.75	29.9	6.1	D.B.
1.40-1.50	11.6	1.2	16.0	16.9	65.9	0.60	41.6	8.8	A.D.B.
	11.6		16.2	17.1	66.7	0.61	41.5	8.9	D.B.
1.50-1.60	5.6	1.3	26.6				47.2	10.9	A.D.B.
	5.7		27.0				47.2	11.1	D.B.
+1.60	52.8	1.6	81.4				100.0	48.1	A.D.B.
	52.8		82.7				100.0	48.9	D.B.

COMPOSITE 1/4" x 65M FLOATS @ 1.50 S.G., A.D.B.						
F.S.I.	P% ON COAL	DILATATION TEST				
		SOFTENING TEMP. (°C)	MAX. DIL. TEMP. (°C)	MAXIMUM CONTR. %	MAXIMUM DIL. %	G. NO.
5 1/2	.04	395	--	10% @ 434°	--	--

Birtley Engineering

Subsidiary of Great West Steel Industries

Lab. No. 8476 Date Feb. 25, 1977

Client: ELCO MINING LTD.

Sample Identification: DH-37-3

Starting Temperature °C: 350

Softening Temperature °C: 395

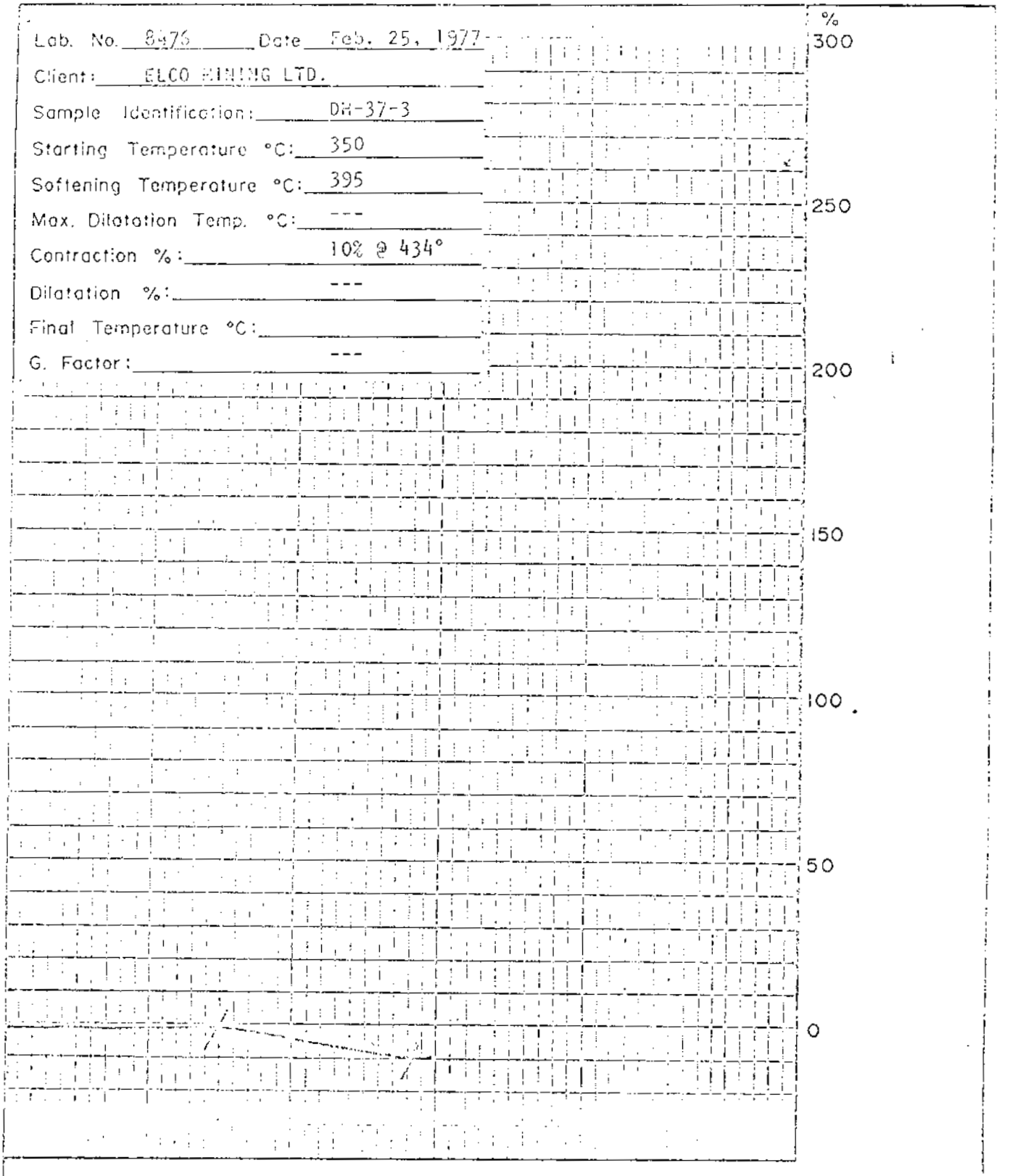
Max. Dilatation Temp. °C: ---

Contraction %: 10% @ 434°

Dilatation %: ---

Final Temperature °C:

G. Factor: ---



BIRTLEY ENGINEERING (CANADA) LTD.

Title	Date
RUHR DILATOMETER TEST	
	Drawn

ELCO MINING LTD.

CORE SAMPLE ANALYSIS

HOLE NO.: DH - 37 - 4 Lab. No. 8477 DATE: Feb./77

HEAD RAW ANALYSIS						
R.M. %	ASH %	V.M. %	F.C. %	S. %	H.G.I.	REMARKS.
0.8	28.6	14.7	55.9	0.67	76	Air Dried Basis
	28.8	14.8	56.4	0.68	--	Dry Basis

SIZE/RAW ANALYSES								
SIZE FRACTION	WT. %	R.M. %	ASH %	S. %	CUMULATIVE WT. %	CUMULATIVE ASH %	CUMULATIVE S. %	
1/4" x 65M	91.2	0.6	29.4	0.70	91.2	29.4	0.70	A.D.B.
	91.2		29.6	0.71	91.2	29.6	0.71	D.B.
65M x 0	8.8	0.8	20.4	0.80	100.0	28.6	0.71	A.D.B.
	8.8		20.6	0.81	100.0	28.8	0.72	D.B.

SINK-FLOAT ANALYSIS: 1/4" x 65M									
S. G.	WT. %	R.M. %	ASH %	V.M. %	F.C. %	S. %	CUMULATIVE WT. %	CUMULATIVE ASH %	
-1.40	53.0	1.0	6.0	18.1	74.9	0.92	53.0	6.0	A.D.B.
	53.0		6.1	18.3	75.6	0.93	53.0	6.1	D.B.
1.40-1.50	10.4	0.9	16.6	16.6	65.9	0.74	63.4	7.7	A.D.B.
	10.4		16.8	16.8	66.4	0.75	63.4	7.9	D.B.
1.50-1.60	2.9	0.8	26.1				66.3	8.5	A.D.B.
	2.9		26.3				66.3	8.7	D.B.
+1.60	33.7	1.0	68.4				100.0	28.7	A.D.B.
	33.7		69.1				100.0	29.0	D.B.

COMPOSITE 1/4" x 65M FLOATS @ 1.50 S.G., A.D.B.						
F.S.I.	P% ON COAL	DILATATION TEST				
		SOFTENING TEMP. (°C)	MAX. DIL. TEMP. (°C)	MAXIMUM CONTR. %	MAXIMUM DIL. %	G. NO.
5	,06	401	--	12% @ 437°	--	--

Birtley Engineering

Subsidiary of Great West Steel Industries

Lab. No. 8477 Date Feb. 25, 1977

Client: ELCO MINING LTD.

Sample Identification: DH-37-4

Starting Temperature °C: 350

Softening Temperature °C: 401

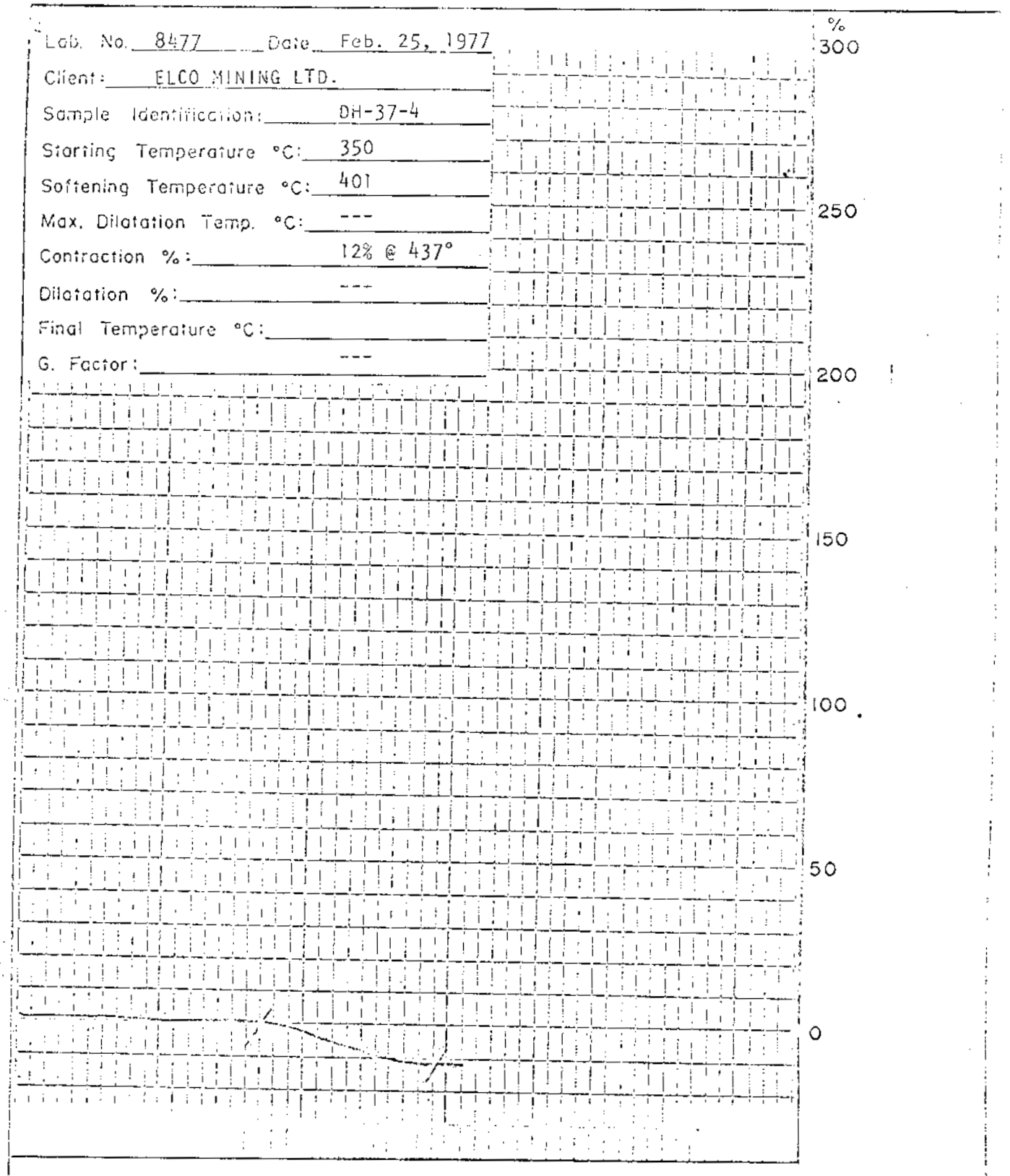
Max. Dilatation Temp. °C: ---

Contraction %: 12% @ 437°

Dilatation %: ---

Final Temperature °C:

G. Factor: ---



BIRTLEY ENGINEERING (CANADA) LTD.

Title	Date
RUHR DILATOMETER TEST	
	Drawn

ELCO MINING LTD.

CORE SAMPLE ANALYSIS

HOLE NO.: DH - 37 - 5 Lab. No. 8478 DATE: Feb./77

HEAD RAW ANALYSIS						
R.M. %	ASH %	V.M. %	F.C. %	S. %	H.G.I.	REMARKS
0.7	21.6	16.3	61.4	0.39	112	Air Dried Basis
	21.8	16.4	61.8	0.39	---	Dry Basis

SIZE / RAW ANALYSES								
SIZE FRACTION	WT. %	R.M. %	ASH %	S. %	CUMULATIVE WT. %	CUMULATIVE ASH %	CUMULATIVE S. %	
1/4" x 65M	87.9	0.7	23.2	0.41	87.9	23.2	0.41	A.D.B.
	87.9		23.4	0.41	87.9	23.4	0.41	D.B.
65M x 0	12.1	0.8	17.1	0.40	100.0	22.5	0.41	A.D.B.
	12.1		17.2	0.40	100.0	22.6	0.41	D.B.

SINK - FLOAT ANALYSIS: 1/4" x 65M									
S. G.	WT. %	R.M. %	ASH %	V.M. %	F.C. %	S. %	CUMULATIVE WT. %	CUMULATIVE ASH %	
-1.40	57.0	2.3	5.3	18.1	74.3	0.48	57.0	5.3	A.D.B.
	56.9		5.4	18.5	76.1	0.49	56.9	5.4	D.B.
1.40-1.50	14.5	1.4	13.8	16.8	68.0	0.43	71.5	7.0	A.D.B.
	14.6		14.0	17.0	69.0	0.44	71.5	7.2	D.B.
1.50-1.60	4.6	1.9	22.5				76.1	8.0	A.D.B.
	4.6		22.9				76.1	8.1	D.B.
+1.60	23.9	1.8	74.0				100.0	23.7	A.D.B.
	23.9		75.4				100.0	24.2	D.B.

COMPOSITE 1/4" x 65M FLOATS @ 1.50 S.G., A.D.B.							
F.S.I.	P% ON COAL	DILATATION TEST					
		SOFTENING TEMP. (°C)	MAX. DIL. TEMP. (°C)	MAXIMUM CONTR. %	MAXIMUM DIL. %	G. NO.	
2 1/2	.03	404	--	13% @ 449°	--	--	

Birtley Engineering

Subsidiary of Great West Steel Industries

Lab. No. 8478 Date Feb. 25, 1977

Client: ELCO MINING LTD.

Sample Identification: DH-37-5

Starting Temperature °C: 350

Softening Temperature °C: 404

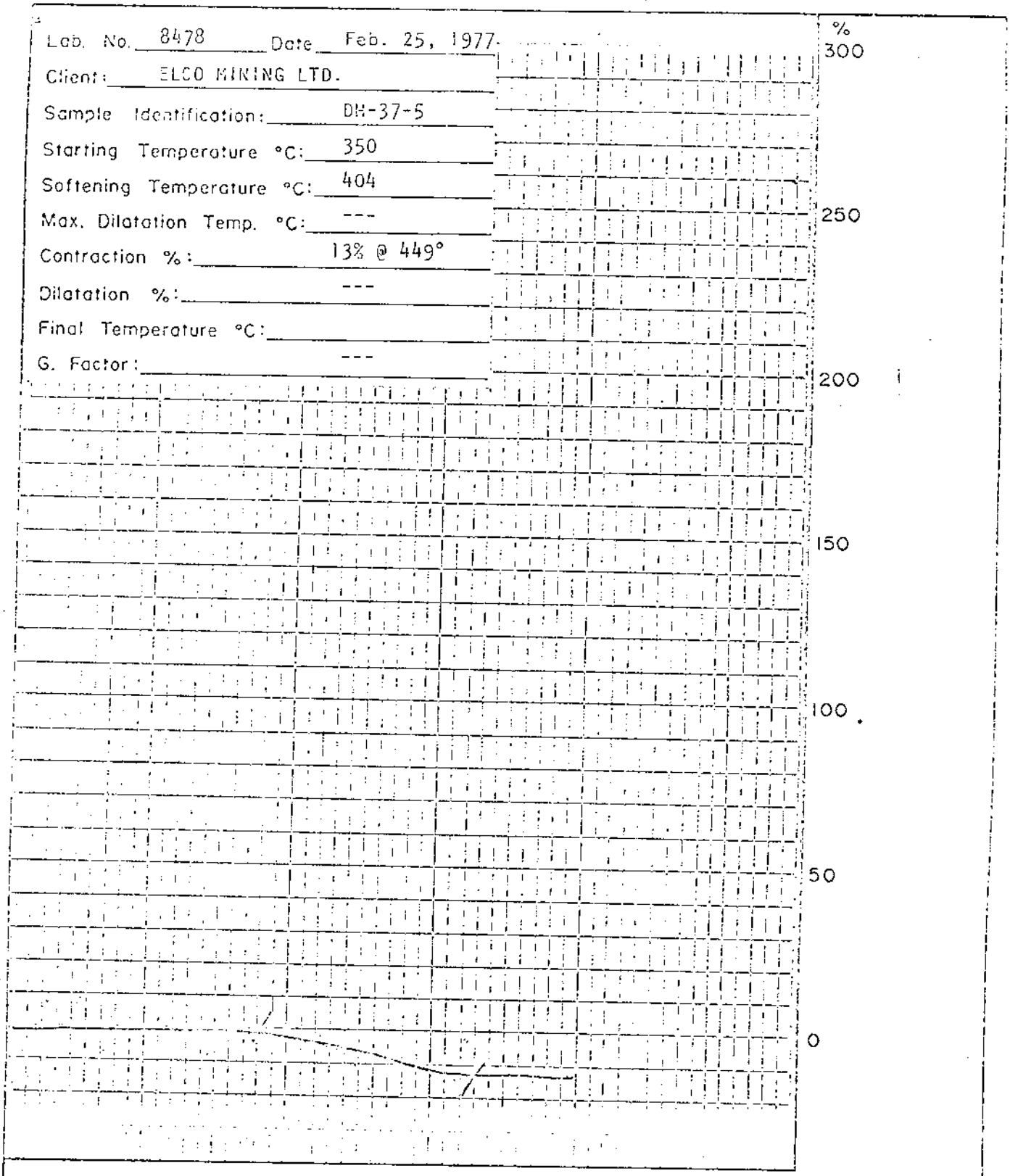
Max. Dilatation Temp. °C: ---

Contraction %: 13% @ 449°

Dilatation %: ---

Final Temperature °C:

G. Factor: ---



BARTLEY ENGINEERING (CANADA) LTD.

Title	Date
RUHR DILATOMETER TEST	
	Drawn

ELCO MINING LTD.

CORE SAMPLE ANALYSIS

HOLE NO.: DH - 37 - 6 Lab. No. 8479 DATE: Feb./77

HEAD RAW ANALYSIS						
R.M. %	ASH %	V.M. %	F.C. %	S. %	H.G.I.	REMARKS
0.7	17.6	17.2	64.5	0.55	108	Air Dried Basis
	17.7	17.3	65.0	0.55	---	Dry Basis

SIZE/RAW ANALYSES								
SIZE FRACTION	WT. %	R.M. %	ASH %	S. %	CUMULATIVE WT. %	CUMULATIVE ASH %	CUMULATIVE S. %	
1/4" x 65M	87.1	0.7	17.5	0.52	87.1	17.5	0.52	A.D.B.
	87.1		17.6	0.52	87.1	17.6	0.52	D.B.
65M x 0	12.9	0.7	12.7	0.62	100.0	16.9	0.53	A.D.B.
	12.9		12.8	0.62	100.0	17.0	0.53	D.B.

SINK-FLOAT ANALYSIS: 1/4" x 65M									
S. G.	WT. %	R.M. %	ASH %	V.M. %	F.C. %	S. %	CUMULATIVE WT. %	CUMULATIVE ASH %	
-1.40	75.6	2.2	5.0	20.5	72.3	0.66	75.6	5.0	A.D.B.
	75.4		5.1	21.0	73.9	0.67	75.4	5.1	D.B.
1.40-1.50	5.0	1.1	18.4	17.3	63.2	0.58	80.6	5.8	A.D.B.
	5.1		18.6	17.5	63.9	0.59	80.5	6.0	D.B.
1.50-1.60	3.9	1.3	28.3				84.5	6.9	A.D.B.
	3.9		28.7				84.4	7.0	D.B.
+1.60	15.5	1.4	69.3				100.0	16.5	A.D.B.
	15.6		70.3				100.0	16.9	D.B.

COMPOSITE 1/4" x 65M FLOATS @ 1.50 S.G., A.D.B.						
F.S.I.	P% OF COAL	DILATATION TEST SOFTENING TEMP. (°C)	MAX. DIL. TEMP. (°C)	MAXIMUM CONTR. %	MAXIMUM DIL. %	G. NO.
8 1/2	.01	401	455	12	28	1.026

Birtley Engineering

Subsidiary of Great West Steel Industries

Lab. No. 8479 Date Feb. 25, 1977

Client: ELCO MINING LTD.

Sample Identification: DH-37-6

Starting Temperature °C: 350

Softening Temperature °C: 401

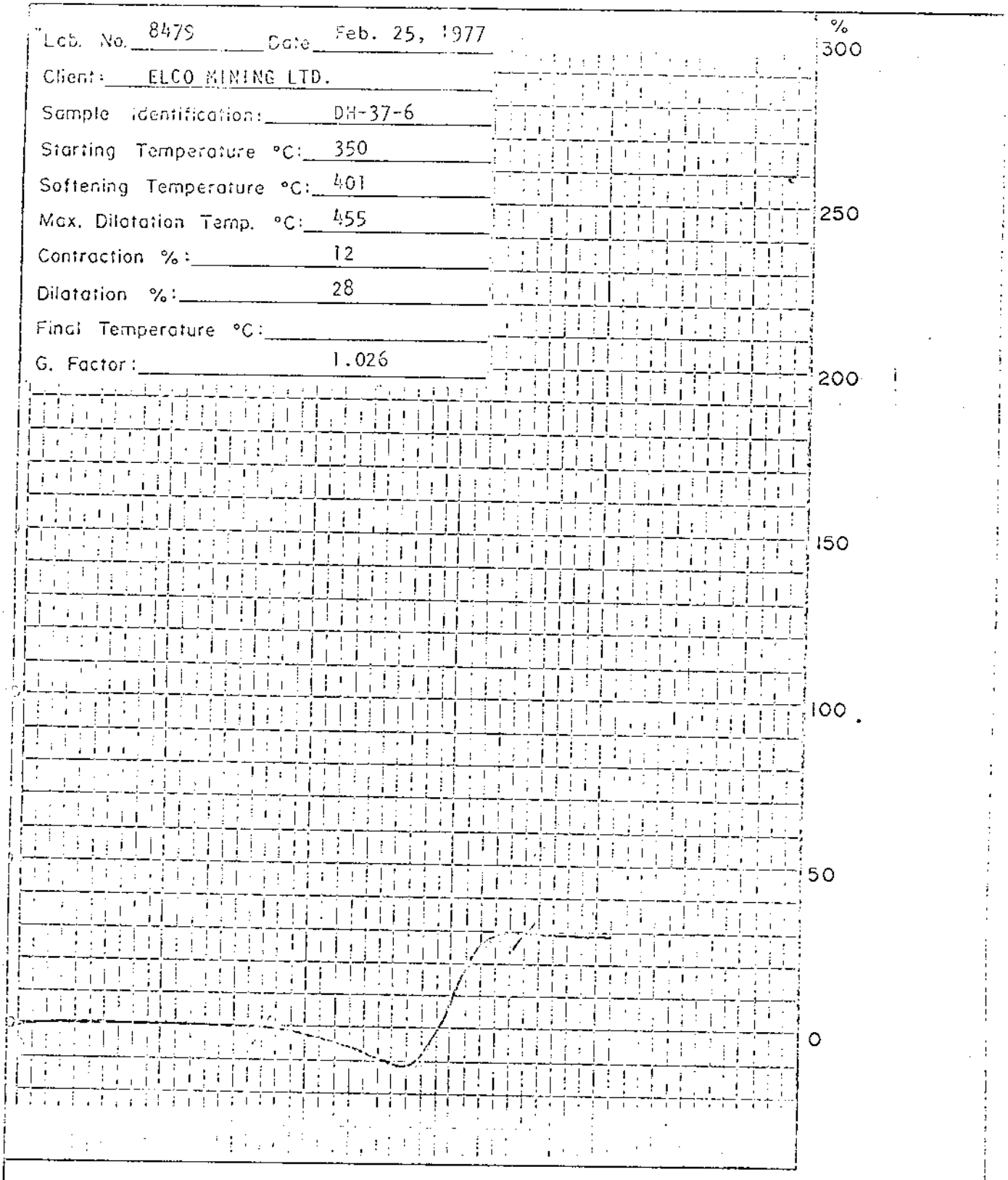
Max. Dilatation Temp. °C: 455

Contraction %: 12

Dilatation %: 28

Final Temperature °C:

G. Factor: 1.026



BIRTLEY ENGINEERING (CANADA) LTD.

Title

RUHR DILATOMETER TEST

Date

Drawn

ELCO MINING LTD.

CORE SAMPLE ANALYSIS

HOLE NO.: DH - 37 - 7 Lab. No. 8527 DATE: March/77

HEAD RAW ANALYSIS						
R.M. %	ASH %	V.M. %	F.C. %	S. %	H.G.I.	REMARKS
0.8	65.3	11.6	22.3	0.29	85	Air Dried Basis
	65.8	11.7	22.5	0.29	--	Dry Basis

SIZE / RAW ANALYSES								
SIZE FRACTION	WT. %	R.M. %	ASH %	S. %	CUMULATIVE WT. %	CUMULATIVE ASH %	CUMULATIVE S. %	
1/4" x 65M	91.2	1.1	66.2	0.30	91.2	66.2	0.30	A.D.B.
	91.2		66.9	0.30	91.2	66.9	0.30	D.B.
65M x 0	8.8	0.9	49.8	0.38	100.0	64.8	0.31	A.D.B.
	8.8		50.3	0.38	100.0	65.4	0.31	D.B.

SINK - FLOAT ANALYSIS: 1/4" x 65M									
S. G.	WT. %	R.M. %	ASH %	V.M. %	F.C. %	S. %	CUMULATIVE WT. %	CUMULATIVE ASH %	
-1.40	21.7	1.0	7.8	22.6	68.6	0.58	21.7	7.8	A.D.B.
	21.7		7.9	22.8	69.3	0.59	21.7	7.9	D.B.
1.40-1.50	6.3	1.0	13.1	21.2	64.7	0.54	28.0	9.0	A.D.B.
	6.3		13.2	21.4	65.4	0.55	28.0	9.1	D.B.
1.50-1.60	2.1	2.1	21.4				30.1	9.9	A.D.B.
	2.1		21.9				30.1	10.0	D.B.
+1.60	69.9	1.1	89.3				100.0	65.4	A.D.B.
	69.9		90.3				100.0	66.1	D.B.

COMPOSITE 1/4" x 65M FLOATS @ 1.50 S.G., A.D.B.						
F.S.I.	P% ON COAL	DILATATION TEST				
		SOFTENING TEMP. (°C)	MAX. DIL. TEMP. (°C)	MAXIMUM CONTR. %	MAXIMUM DIL. %	G. NO.
8 1/2	.01	365	443	17	210	1.089

Birtley Engineering

Subsidiary of Great West Steel Industries

Lab. No. 8527 Date March 1, 1977

Client: ELCO MINING LTD.

Sample Identification: DH-37-7

Starting Temperature °C: 350

Softening Temperature °C: 365

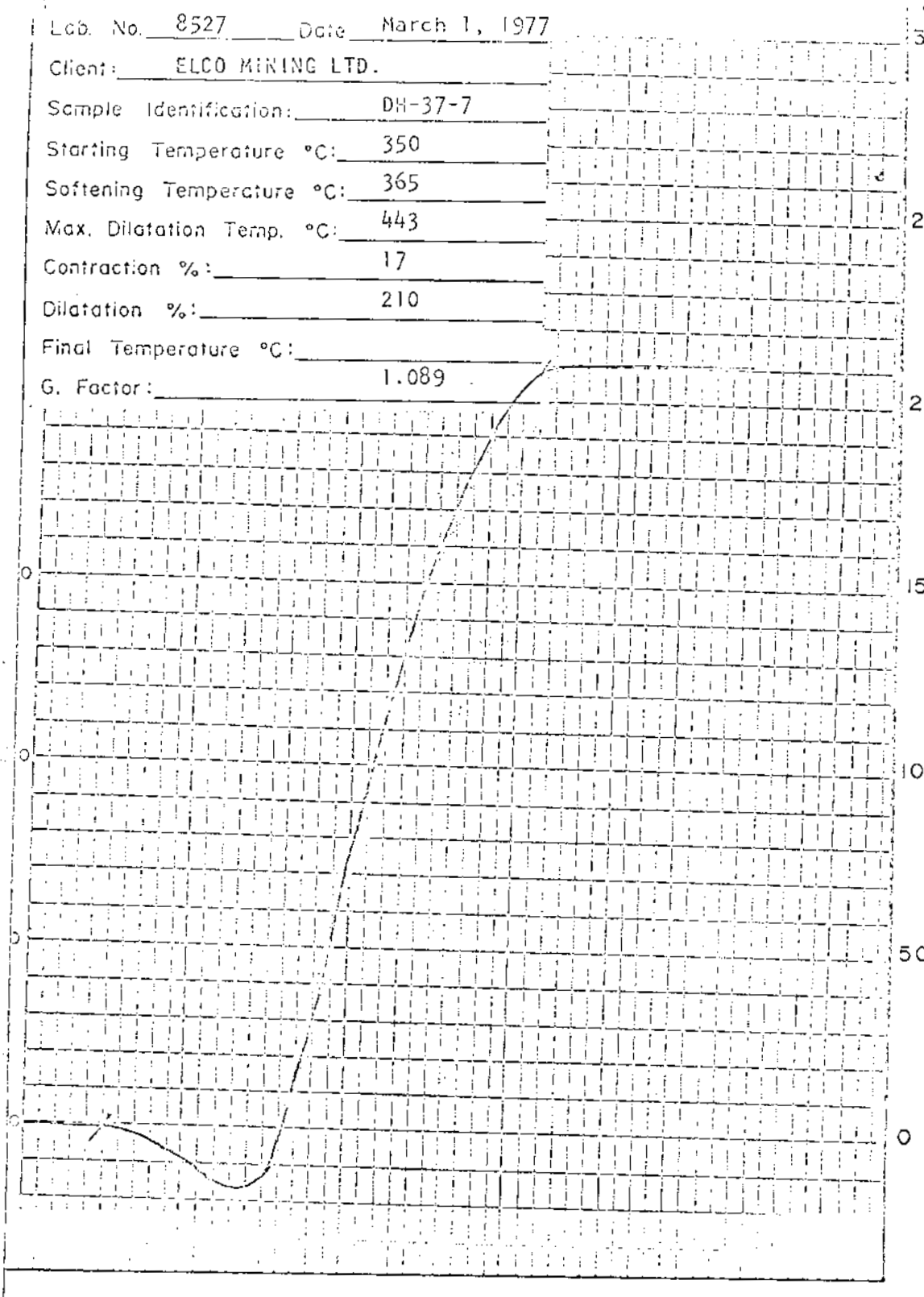
Max. Dilatation Temp. °C: 443

Contraction %: 17

Dilatation %: 210

Final Temperature °C:

G. Factor: 1.089



BIRTLEY ENGINEERING (CANADA) LTD.

Title

RUHR DILATOMETER TEST

Date

Drawn

ELCO MINING LTD.

CORE SAMPLE ANALYSIS

HOLE NO.: DH - 37 - 8 Lab. No. 8528 DATE: March/77

HEAD RAW ANALYSIS						
R.M. %	ASH %	V.M. %	F.C. %	S. %	H.G.I.	REMARKS
0.7	21.2	17.4	60.7	0.51	81	Air Dried Basis
	21.3	17.5	61.2	0.51	--	Dry Basis

SIZE/RAW ANALYSES								
SIZE FRACTION	WT. %	R.M. %	ASH %	S. %	CUMULATIVE WT. %	CUMULATIVE ASH %	CUMULATIVE S. %	
1/4" x 65M	91.2	0.8	21.0	0.48	91.2	21.0	0.48	A.D.B.
	91.2		21.2	0.48	91.2	21.2	0.48	D.B.
65M x 0	8.8	0.7	21.3	0.60	100.0	21.0	0.49	A.D.B.
	8.8		21.5	0.60	100.0	21.2	0.49	D.B.

SINK-FLOAT ANALYSIS: 1/4" x 65M									
S. G.	WT. %	R.M. %	ASH %	V.M. %	F.C. %	S. %	CUMULATIVE WT. %	CUMULATIVE ASH %	
-1.40	68.6	0.7	4.5	19.9	74.9	0.54	68.6	4.5	A.D.B.
	68.6		4.5	20.0	75.5	0.54	68.6	4.5	D.B.
1.40-1.50	7.1	0.6	17.8	17.3	64.3	0.36	75.7	5.7	A.D.B.
	7.1		17.9	17.4	64.7	0.36	75.7	5.8	D.B.
1.50-1.60	3.8	0.7	29.2				79.5	6.9	A.D.B.
	3.8		29.4				79.5	6.9	D.B.
+1.60	20.5	1.0	76.0				100.0	21.0	A.D.B.
	20.5		76.8				100.0	21.2	D.B.

COMPOSITE 1/4" x 65M FLOATS @ 1.50 S.G., A.D.B.						
F.S.I.	P% ON COAL	DILATATION TEST				
		SOFTENING TEMP. (°C)	MAX. DIL. TEMP. (°C)	MAXIMUM CONTR. %	MAXIMUM DIL. %	G. NO.
7 1/2	.03	398	455	12	2	0.954

Birtley Engineering

Subsidiary of Great West Steel Industries

Lab. No. 8528 Date March 1, 1977

Client: ELCO MINING LTD.

Sample Identification: DH-37-8

Starting Temperature °C: 350

Softening Temperature °C: 398

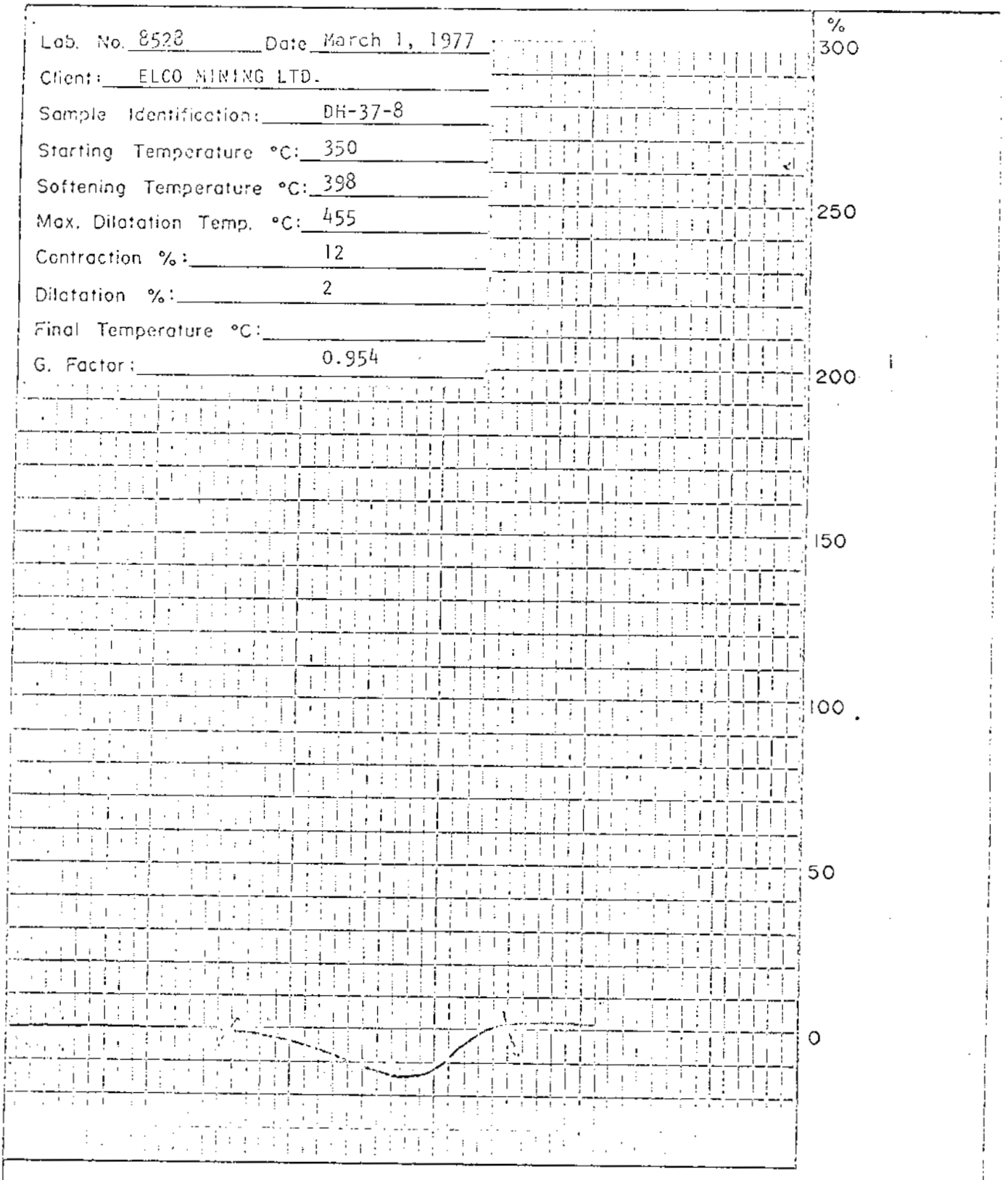
Max. Dilatation Temp. °C: 455

Contraction %: 12

Dilatation %: 2

Final Temperature °C:

G. Factor: 0.954



BIRTLEY ENGINEERING (CANADA) LTD.

Title	Date
RUHR DILATOMETER TEST	
	Drawn

Warnock Hersey Professional Services Ltd.

ELCO MINING LTD.. Elk River Coal Project 1976-77

DRILL CORE ANALYSIS

Sample Identification: DH 38 - 1 Warnock Hersey Lab. No.: 76 - 1280

TABLE I Raw Coal Head Sample ¼" x 0

AIR DRIED BASIS						% DRY BASIS			
Moist.	Ash	V.M.	F. C.	Sulphur	H.G.I.	Ash	V. M.	F.C.	Sulphur
0.6	23.8	18.4	57.2	0.50	85.8	23.9	18.6	57.5	0.50

TABLE II Screen Analysis

	AIR DRIED BASIS				DRY BASIS	
Size	Weight %	Moisture	ASH	Sulphur	ASH	Sulphur
¼" x 65	83.6	0.6	25.6	0.44	25.7	0.44
65 x 0	16.4	0.7	18.3	0.55	18.5	0.55
TOTAL	100.0	--	--	--	24.5	0.46

TABLE III Float/Sink ¼" x 65 Fraction

Spec. Grav.		AIR DRIED BASIS						DRY BASIS			
Sink	Float	Weight%	Moist.	Ash	V.M.	F.C.	Sulphur	ASH	V.M.	F.C.	Sulphur
	1.40	61.9	0.9	5.0	21.4	72.7	0.55	5.0	21.6	73.4	0.56
1.40	1.50	7.5	0.9	14.2	19.6	65.3	0.53	14.3	19.8	65.9	0.53
1.50	1.60	3.6	0.7	22.4	18.0	58.9	0.52	22.6	18.1	59.3	0.52
1.60		27.0	--	--	--	--	--	77.4	--	--	--
TOTAL		100.0	--	--	--	--	--	25.9	--	--	--

TABLE IV Cumulative 1.60 Float

F.S.I.	Phosphorus (in coal)	DILATATION					
		TEMPERATURE °C			PER CENT		"G" FACTOR
		Initial	Softening	Maximum Dilatation	Maximum Contraction	Maximum Dilatation	
6	0.010	350°C	401°C	---	10% @ 437°	---	---

Lab. No. 8155 Date Jan. 26/77

Client: Warnock Hersey

Sample Identification: 76-1280

Starting Temperature °C: 350

Softening Temperature °C: 401

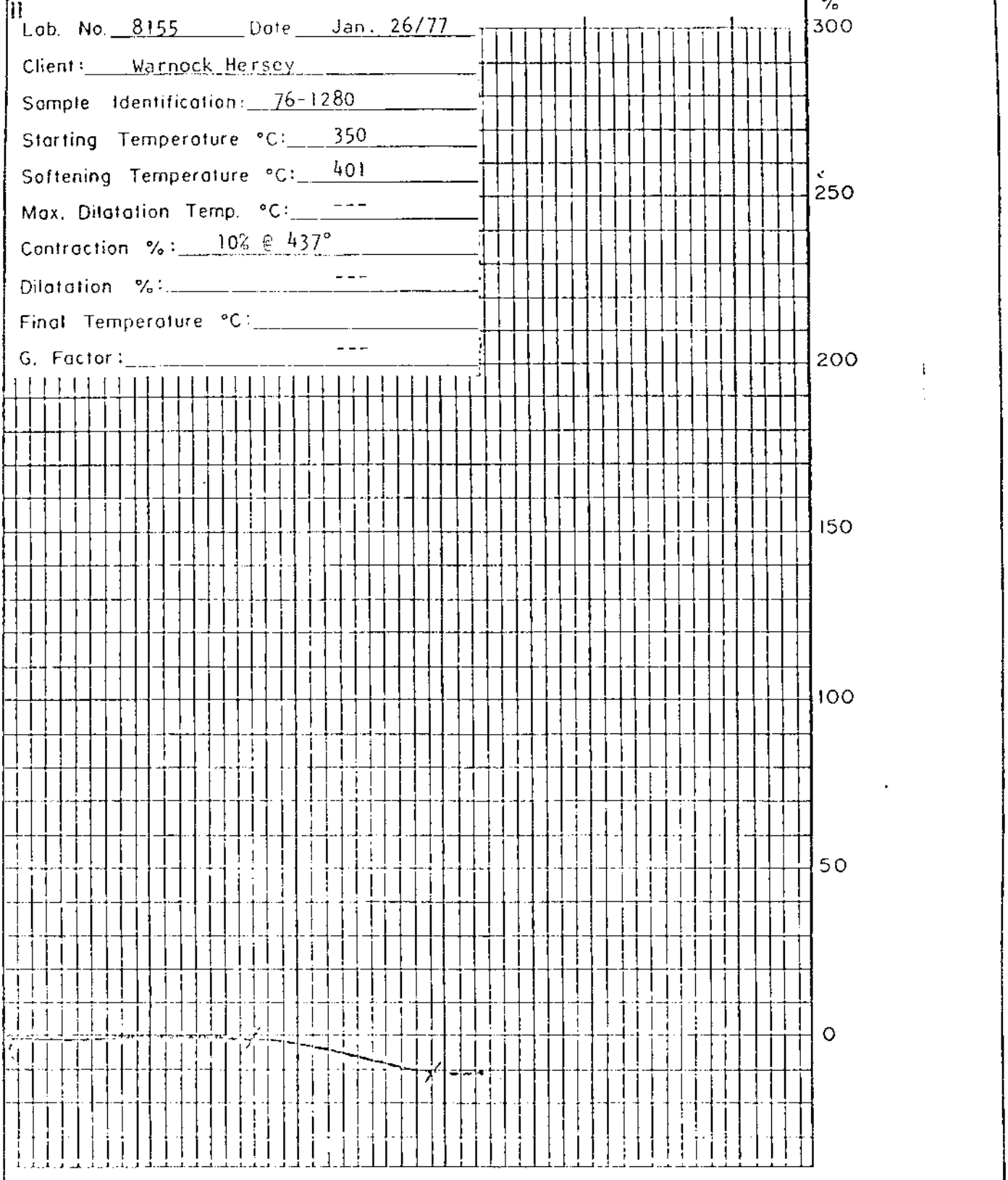
Max. Dilatation Temp. °C: ---

Contraction %: 10% @ 437°

Dilatation %: ---

Final Temperature °C:

G. Factor: ---



BIRTLEY ENGINEERING (CANADA) LTD.

Title	Date
RUHR DILATOMETER TEST	
	Drawn

Warnock Hersey Professional Services Ltd.

ELCO MINING LTD.. Elk River Coal Project 1976-77

DRILL CORE ANALYSIS

Sample Identification: DH 38 - 2 Warnock Hersey Lab. No.: 76 - 1281

TABLE I Raw Coal Head Sample ¼" x 0

AIR DRIED BASIS						% DRY BASIS			
Moist.	Ash	V.M.	F. C.	Sulphur	H.G.I.	Ash	V. M.	F.C.	Sulphur
0.5	18.2	17.8	63.5	0.38	92.7	18.3	17.9	63.8	0.38

TABLE II Screen Analysis

	AIR DRIED BASIS				DRY BASIS	
Size	Weight %	Moisture	ASH	Sulphur	ASH	Sulphur
¼" x 65	84.6	0.5	18.2	0.39	18.3	0.39
65 x 0	15.4	0.6	11.6	0.49	11.7	0.49
TOTAL	100.0	- -	- -	- -	17.3	0.40

TABLE III Float/Sink ¼" x 65 Fraction

Spec. Grav.		AIR DRIED BASIS						DRY BASIS			
Sink	Float	Weight%	Moist.	Ash	V.M.	F.C.	Sulphur	ASH	V.M.	F.C.	Sulphur
	1.40	65.1	0.6	4.7	20.1	74.6	0.55	4.7	20.3	75.0	0.55
1.40	1.50	9.9	0.5	16.3	18.4	64.8	0.59	16.4	18.5	65.1	0.59
1.50	1.60	6.3	0.6	24.0	16.9	58.5	0.42	24.2	17.0	58.8	0.42
1.60		18.7	- -	- -	- -	- -	- -	60.7	- -	- -	- -
TOTAL		100.0	- -	- -	- -	- -	- -	17.5	- -	- -	- -

TABLE IV Cumulative 1.60 Float

F.S.I.	Phosphorus (in coal)	DILATATION					
		TEMPERATURE °C			PER CENT		"G" FACTOR
		Initial	Softening	Maximum Dilatation	Maximum Contraction	Maximum Dilatation	
2½	0.018	350°C	401°C	- - -	12% @ 443°	- - -	- - -

Lab. No. 8156 Date Jan. 26/77

Client: Warnock Hersey

Sample Identification: 76-1281

Starting Temperature °C: 350

Softening Temperature °C: 401

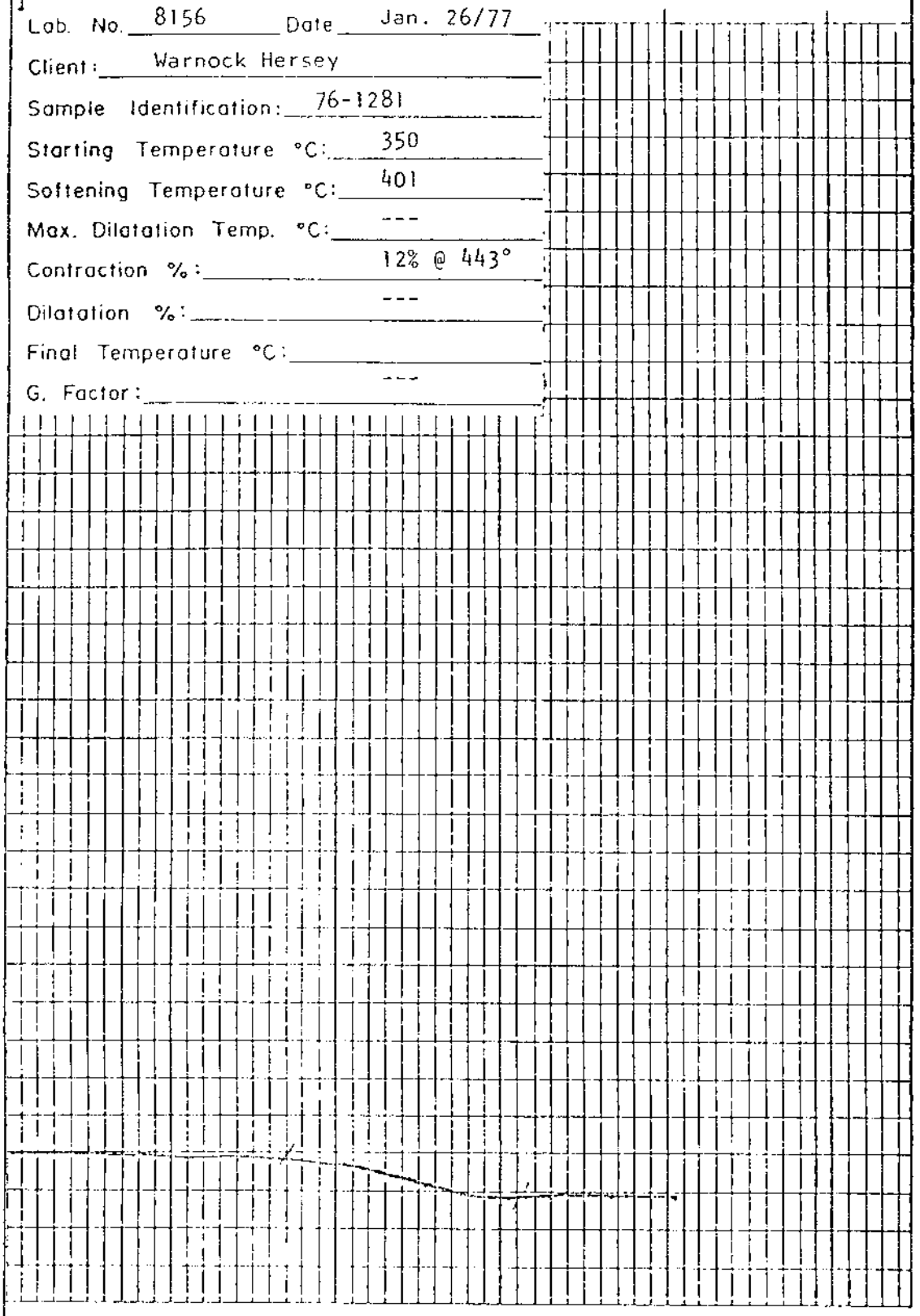
Max. Dilatation Temp. °C: ---

Contraction %: 12% @ 443°

Dilatation %: ---

Final Temperature °C:

G. Factor: ---



BIRTLEY ENGINEERING (CANADA) LTD.

Title	Date
RUHR DILATOMETER TEST	
	Drawn

Warnock Hersey Professional Services Ltd.

ELCO MINING LTD.. Elk River Coal Project 1976-77

DRILL CORE ANALYSIS

Sample Identification: DH 38 - 3 Warnock Hersey Lab. No.: 76 - 1282

TABLE I Raw Coal Head Sample ¼" x 0

AIR DRIED BASIS						% DRY BASIS			
Moist.	Ash	V.M.	F. C.	Sulphur	H.G. I.	Ash	V. M.	F.C.	Sulphur
0.4	11.1	18.9	69.6	0.62	106.6	11.0	19.0	70.0	0.62

TABLE II Screen Analysis

	AIR DRIED BASIS				DRY BASIS	
Size	Weight %	Moisture	ASH	Sulphur	ASH	Sulphur
¼" x 65	77.4	0.4	12.6	0.62	12.7	0.62
65 x 0	22.6	0.5	6.5	0.73	6.6	0.73
TOTAL	100.0	--	--	--	11.3	0.64

TABLE III Float/Sink ¼" x 65 Fraction

Spec. Grav.		AIR DRIED BASIS						DRY BASIS			
Sink	Float	Weight%	Moist.	Ash	V.M.	F.C.	Sulphur	ASH	V.M.	F.C.	Sulphur
	1.40	72.0	0.5	4.9	19.2	75.4	0.68	4.9	19.3	75.8	0.68
1.40	1.50	10.8	0.6	15.0	17.4	67.0	0.63	15.1	17.5	67.4	0.63
1.50	1.60	5.8	0.5	22.1	16.3	61.1	0.49	22.2	16.4	61.4	0.49
1.60		11.4	--	--	--	--	--	50.0	--	--	--
TOTAL		100.0	--	--	--	--	--	12.2	--	--	--

TABLE IV Cumulative 1.60 Float

F.S.I.	Phosph-orus (in coal)	DILATATION					
		TEMPERATURE °C			PER CENT		"G" FACTOR
		Initial	Softening	Maximum Dilatation	Maximum Contraction	Maximum Dilatation	
4	0.046	350°C	407°C	---	12% @ 470	---	---

II

Lab. No. 8157 Date Jan. 26/77

Client: Warnock Hersey

Sample Identification: 76-1282

Starting Temperature °C: 350

Softening Temperature °C: 407

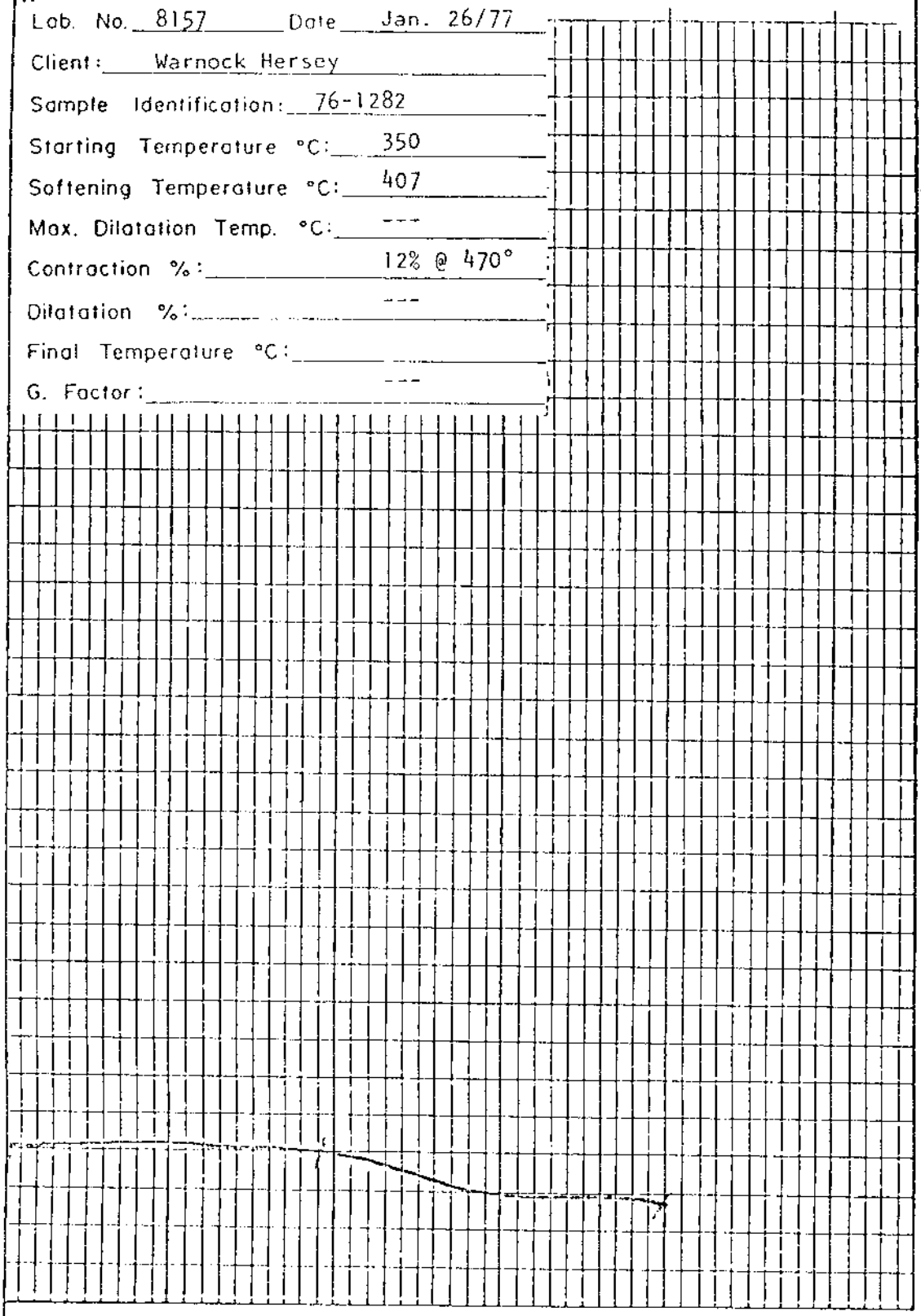
Max. Dilatation Temp. °C: ---

Contraction %: 12% @ 470°

Dilatation %: ---

Final Temperature °C:

G. Factor: ---



BIRTLEY ENGINEERING (CANADA) LTD.

Title

RUHR DILATOMETER TEST

Date

Drawn

Warnock Hersey Professional Services Ltd.

CLIENT - Elco Mining Ltd.,

Sample Identification - DH 38 - 3

Lab. No. - 76 - 1282

Footage -

	CLEAN - 1.50 Composite
As Analyzed Basis	
Moisture % (Inherent) -	1.4
Ash % -	6.2
Volatile Matter % -	19.0
Fixed Carbon % -	73.4
Total -	100.0
Sulphur % -	0.67
FSI -	4
Btu per lb. -	14,235
Equilibrium Moisture % -	1.5
~~Hardgrove Grindability~~ × Carbon Dioxide	0.07
Specific Gravity (20 mesh) -	
Dry Basis	
Ash % -	6.2
Volatile % -	19.1
Btu per lb. -	14,433
Dry, Ash - Free Basis	
Volatile % -	20.6
Btu per lb. -	15,406

FLOAT / SINK ANALYSIS

Specific Gravity		Weight %	Ash %
Sink	Float		
	1.50	82.8	6.2
1.50			

Warnock Hersey Professional Services Ltd.

ELCO MINING LTD.. Elk River Coal Project 1976-77

DRILL CORE ANALYSIS

Sample Identification: DH 38 - 4 Warnock Hersey Lab. No.: 76 - 1283

TABLE I Raw Coal Head Sample ¼" x 0

AIR DRIED BASIS						% DRY BASIS			
Moist.	Ash	V.M.	F. C.	Sulphur	H.G. I.	Ash	V. M.	F.C.	Sulphur
0.4	14.8	18.4	66.4	0.52	95.5	14.9	18.5	66.6	0.52

TABLE II Screen Analysis

	AIR DRIED BASIS				DRY BASIS	
Size	Weight %	Moisture	ASH	Sulphur	ASH	Sulphur
¼" x 65	85.3	0.4	16.2	0.57	16.3	0.57
65 x 0	14.7	0.5	11.6	0.62	11.7	0.62
TOTAL	100.0	- -	- -	- -	15.6	0.58

TABLE III Float/Sink ¼" x 65 Fraction

Spec. Grav.		AIR DRIED BASIS						DRY BASIS			
Sink	Float	Weight%	Moist.	Ash	V.M.	F.C.	Sulphur	ASH	V.M.	F.C.	Sulphur
	1.40	60.9	0.8	5.9	20.2	73.1	0.75	5.9	20.4	73.7	0.76
1.40	1.50	13.0	0.5	16.2	17.6	65.7	0.60	16.3	17.7	66.0	0.60
1.50	1.60	9.8	0.4	22.9	16.7	60.0	0.51	23.0	16.8	60.2	0.51
1.60		16.3	- -	- -	- -	- -	- -	49.9	- -	- -	- -
TOTAL		100.0	- -	- -	- -	- -	- -	16.1	- -	- -	- -

TABLE IV Cumulative 1.60 Float

F.S.I.	Phosph-orus (in coal)	DILATATION					
		TEMPERATURE °C			PER CENT		"G" FACTOR
		Initial	Softening	Maximum Dilatation	Maximum Contraction	Maximum Dilatation	
3.½	0.025	350°C	410°C	- - -	11% @ 452°	- - -	- - -

I

Lab. No. 8158 Date Jan. 26/77

Client: Warnock Hersey

Sample Identification: 76-1283

Starting Temperature °C: 350

Softening Temperature °C: 410

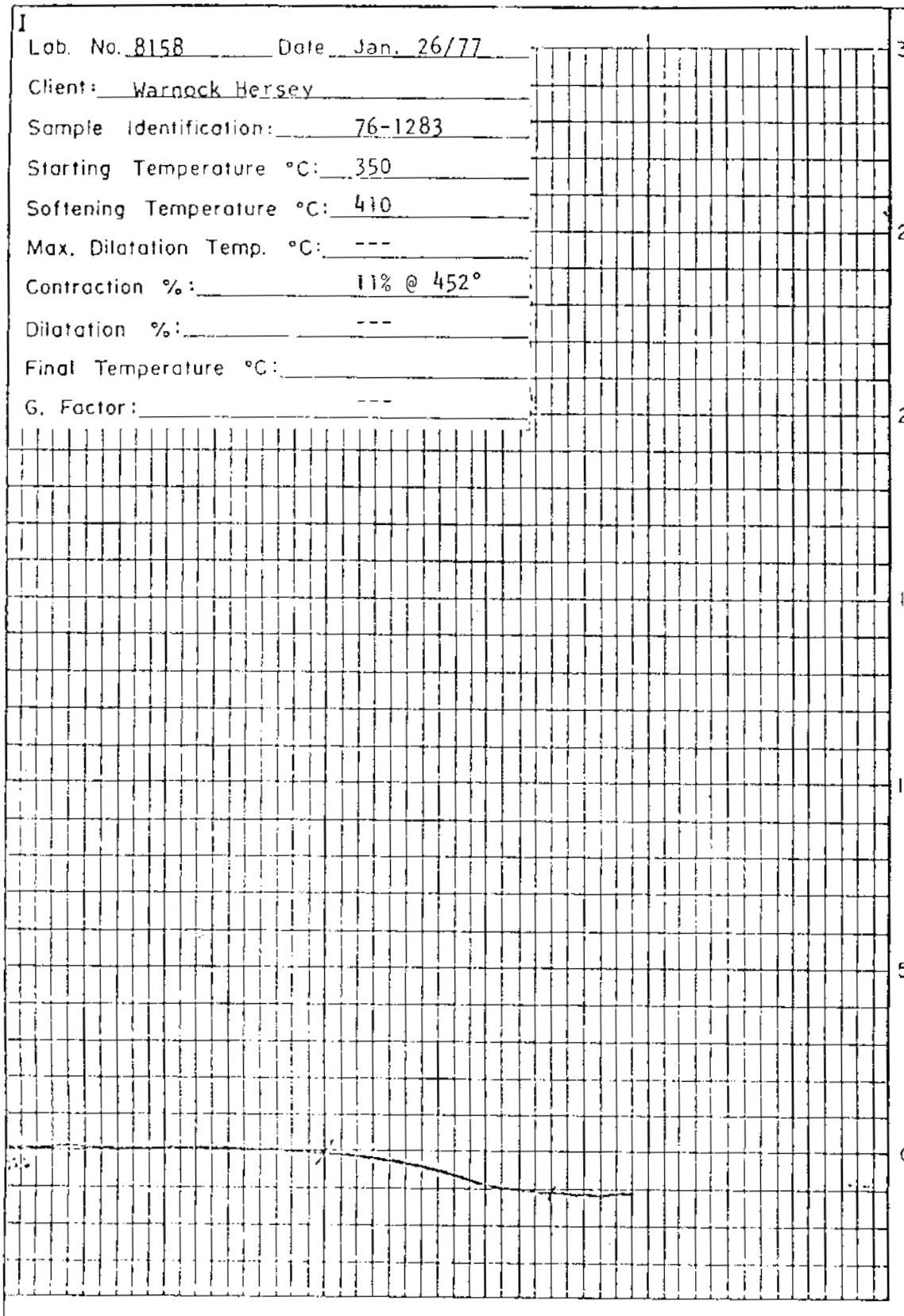
Max. Dilatation Temp. °C: ---

Contraction %: 11% @ 452°

Dilatation %: ---

Final Temperature °C:

G. Factor: ---



BIRTLEY ENGINEERING (CANADA) LTD.

Title

RUHR DILATOMETER TEST

Date

Drawn

Warnock Hersey Professional Services Ltd.

CLIENT - Elco Mining Ltd.,

Sample Identification - DH 38 - 4

Lab. No. - 76 - 1283

Footage -

	CLEAN - 1.50 Composite	
As Analyzed Basis		
Moisture % (Inherent) -	0.7	
Ash % -	7.7	
Volatile Matter % -	19.7	
Fixed Carbon % -	71.9	
Total -	100.0	
Sulphur % -	0.72	
FSI -	3½	
Btu per lb. -	14,014	
Equilibrium Moisture % -	1.4	
~~Hardgrove Grindability~~ -Carbon Dioxide	0.04	
Specific Gravity (20 mesh) -		
Dry Basis		
Ash % -	7.7	
Volatile % -	19.8	
Btu per lb. -	14,177	
Dry, Ash - Free Basis		
Volatile % -	21.5	
Btu per lb. -	15,299	

FLOAT / SINK ANALYSIS

Specific Gravity		Weight %	Ash %
Sink	Float		
	1.50	73.9	7.7
1.50			

Warnock Hersey Professional Services Ltd.

ELCO MINING LTD.. Elk River Coal Project 1976-77

DRILL CORE ANALYSIS

Sample Identification: DH 38 - 5 Warnock Hersey Lab. No.: 76 - 1284

TABLE I Raw Coal Head Sample ¼" x 0

AIR DRIED BASIS						% DRY BASIS			
Moist.	Ash	V.M.	F. C.	Sulphur	H.G.I.	Ash	V. M.	F.C.	Sulphur
0.3	22.5	16.9	60.3	0.49	95.5	22.6	17.0	60.4	0.49

TABLE II Screen Analysis

Size	AIR DRIED BASIS				DRY BASIS	
	Weight %	Moisture	ASH	Sulphur	ASH	Sulphur
¼" x 65	78.7	0.5	25.7	0.51	25.8	0.51
65 x 0	21.3	0.5	12.5	0.64	12.6	0.64
TOTAL	100.0	--	--	--	23.0	0.54

TABLE III Float/Sink ¼" x 65 Fraction

Spec. Grav.		AIR DRIED BASIS						DRY BASIS			
Sink	Float	Weight%	Moist.	Ash	V.M.	F.C.	Sulphur	ASH	V.M.	F.C.	Sulphur
	1.40	34.0	0.7	5.7	19.6	74.0	0.57	5.8	19.7	74.5	0.57
1.40	1.50	14.4	0.5	14.8	18.2	66.5	0.55	14.9	18.3	66.8	0.55
1.50	1.60	17.7	0.4	24.3	16.4	58.9	0.53	24.4	16.5	59.1	0.53
1.60		33.9	--	--	--	--	--	52.6	--	--	--
TOTAL		100.0	--	--	--	--	--	26.3	--	--	--

TABLE IV Cumulative 1.60 Float

F.S.I.	Phosphorus (in coal)	DILATATION					
		TEMPERATURE °C			PER CENT		"G" FACTOR
		Initial	Softening	Maximum Dilatation	Maximum Contraction	Maximum Dilatation	
2½	0.019	350°C	410°C	---	13% @ 467°	---	---

11

Lab. No. 8159 Date Jan. 26/77

Client: Warnock Hersey

Sample Identification: 76-1284

Starting Temperature °C: 350

Softening Temperature °C: 410

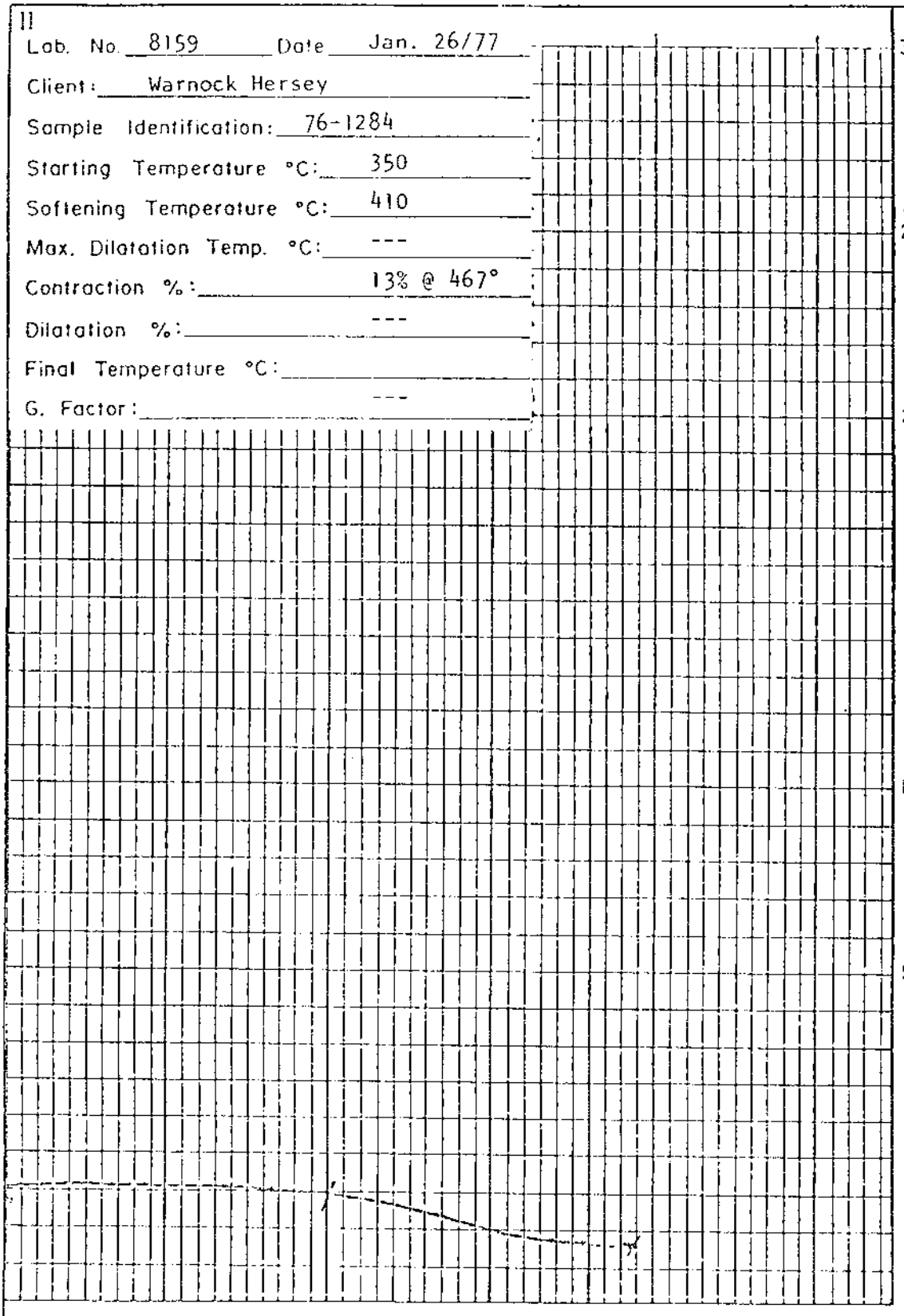
Max. Dilatation Temp. °C: ---

Contraction %: 13% @ 467°

Dilatation %: ---

Final Temperature °C:

G. Factor: ---



BIRTLEY ENGINEERING (CANADA) LTD.

Title	Date
RUHR DILATOMETER TEST	
	Drawn

Warnock Hersey Professional Services Ltd.

ELCO MINING LTD.. Elk River Coal Project 1976-77

DRILL CORE ANALYSIS

Sample Identification: DH 38 - 6 Warnock Hersey Lab. No.: 76 - 1285

TABLE I Raw Coal Head Sample ¼" x 0

AIR DRIED BASIS						% DRY BASIS			
Moist.	Ash	V.M.	F. C.	Sulphur	H.G.I.	Ash	V. M.	F.C.	Sulphur
0.4	27.3	15.0	57.3	0.56	92.7	27.4	15.1	57.5	0.56

TABLE II Screen Analysis

	AIR DRIED BASIS				DRY BASIS	
Size	Weight %	Moisture	ASH	Sulphur	ASH	Sulphur
¼" x 65	82.8	0.5	29.9	0.57	30.0	0.57
65 x 0	17.2	0.6	19.6	0.72	19.7	0.72
TOTAL	100.0	--	--	--	28.2	0.60

TABLE III Float/Sink ¼" x 65 Fraction

Spec. Grav.		AIR DRIED BASIS						DRY BASIS			
Sink	Float	Weight%	Moist.	Ash	V.M.	F.C.	Sulphur	ASH	V.M.	F.C.	Sulphur
	1.40	52.4	0.5	6.0	19.1	74.4	0.72	6.1	19.2	74.7	0.72
1.40	1.50	8.8	0.5	15.3	17.8	66.4	0.66	15.4	17.9	66.7	0.66
1.50	1.60	4.1	0.5	22.7	15.7	61.1	0.57	22.8	15.8	61.4	0.57
1.60		34.7	--	--	--	--	--	72.4	--	--	--
TOTAL		100.0	--	--	--	--	--	30.6	--	--	--

TABLE IV Cumulative 1.60 Float

F.S.I.	Phosphorus (in coal)	DILATATION					
		TEMPERATURE °C			PER CENT		"G" FACTOR
		Initial	Softening	Maximum Dilatation	Maximum Contraction	Maximum Dilatation	
3	0.021	350°C	404°C	---	15% @ 476°	---	---

Lab. No. 8160 Date Jan. 27/77

Client: Warnock Hersey

Sample Identification: 76-1285

Starting Temperature °C: 350

Softening Temperature °C: 404

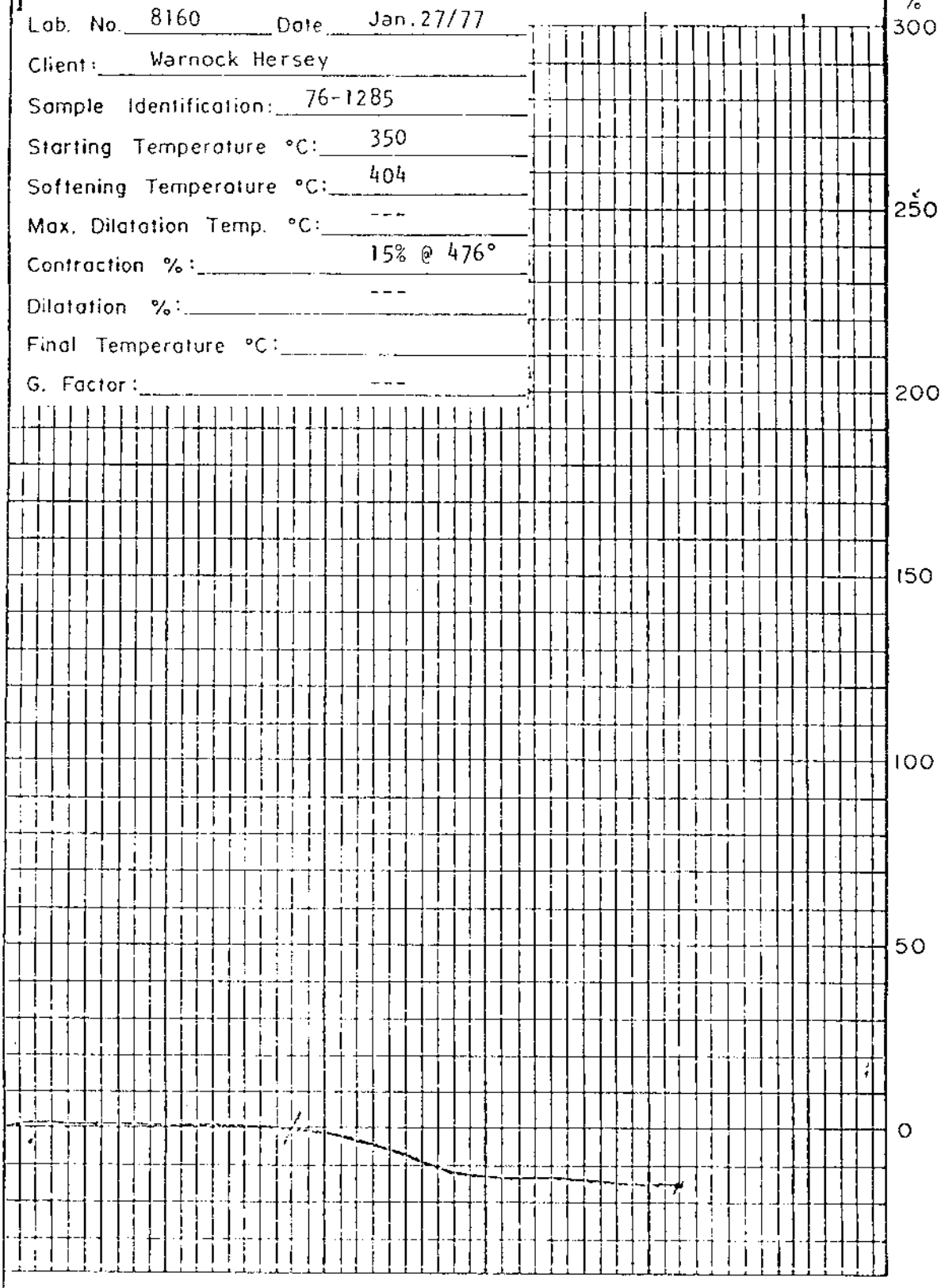
Max. Dilatation Temp. °C: ---

Contraction %: 15% @ 476°

Dilatation %: ---

Final Temperature °C:

G. Factor: ---



BIRTLEY ENGINEERING (CANADA) LTD.

Title	Date
RUHR DILATOMETER TEST	
	Drawn

Warnock Hersey Professional Services Ltd.

ELCO MINING LTD.. Elk River Coal Project 1976-77

DRILL CORE ANALYSIS

Sample Identification: DH 38 - 7 Warnock Hersey Lab. No.: 76 - 1286

TABLE I Raw Coal Head Sample ¼" x 0

AIR DRIED BASIS						% DRY BASIS			
Moist.	Ash	V.M.	F. C.	Sulphur	H.G. I.	Ash	V. M.	F.C.	Sulphur
0.5	45.6	14.3	39.6	0.52	70.5	45.8	14.3	39.9	0.52

TABLE II Screen Analysis

	AIR DRIED BASIS				DRY BASIS	
Size	Weight %	Moisture	ASH	Sulphur	ASH	Sulphur
¼" x 65	85.3	0.7	49.8	0.51	50.2	0.51
65 x 0	14.7	0.6	30.2	0.76	30.3	0.76
TOTAL	100.0	--	--	--	47.3	0.55

TABLE III Float/Sink ¼" x 65 Fraction

Spec. Grav.		AIR DRIED BASIS						DRY BASIS			
Sink	Float	Weight%	Moist.	Ash	V.M.	F.C.	Sulphur	ASH	V.M.	F.C.	Sulphur
	1.40	18.9	0.5	5.5	21.8	72.2	0.89	5.6	21.9	72.5	0.68
1.40	1.50	5.5	0.5	15.4	17.5	66.6	0.60	15.5	17.6	66.9	0.60
1.50	1.60	4.7	0.5	21.4	15.4	62.7	0.54	21.5	15.5	63.0	0.54
1.60		70.9	--	--	--	--	--	69.7	--	--	--
TOTAL		100.0	--	--	--	--	--	52.3	--	--	--

TABLE IV Cumulative 1.60 Float

F.S.I.	Phosph-orus (in coal)	DILATATION					
		TEMPERATURE °C			PER CENT		" G " FACTOR
		Initial	Softening	Maximum Dilatation	Maximum Contraction	Maximum Dilatation	
8	0.076	350°C	395°C	452°C	18%	48%	1.032

II

Lab. No. 8161 Date Jan.27/ 77

Client: Warnock Hersey

Sample Identification: 76-1286

Starting Temperature °C: 350

Softening Temperature °C: 395

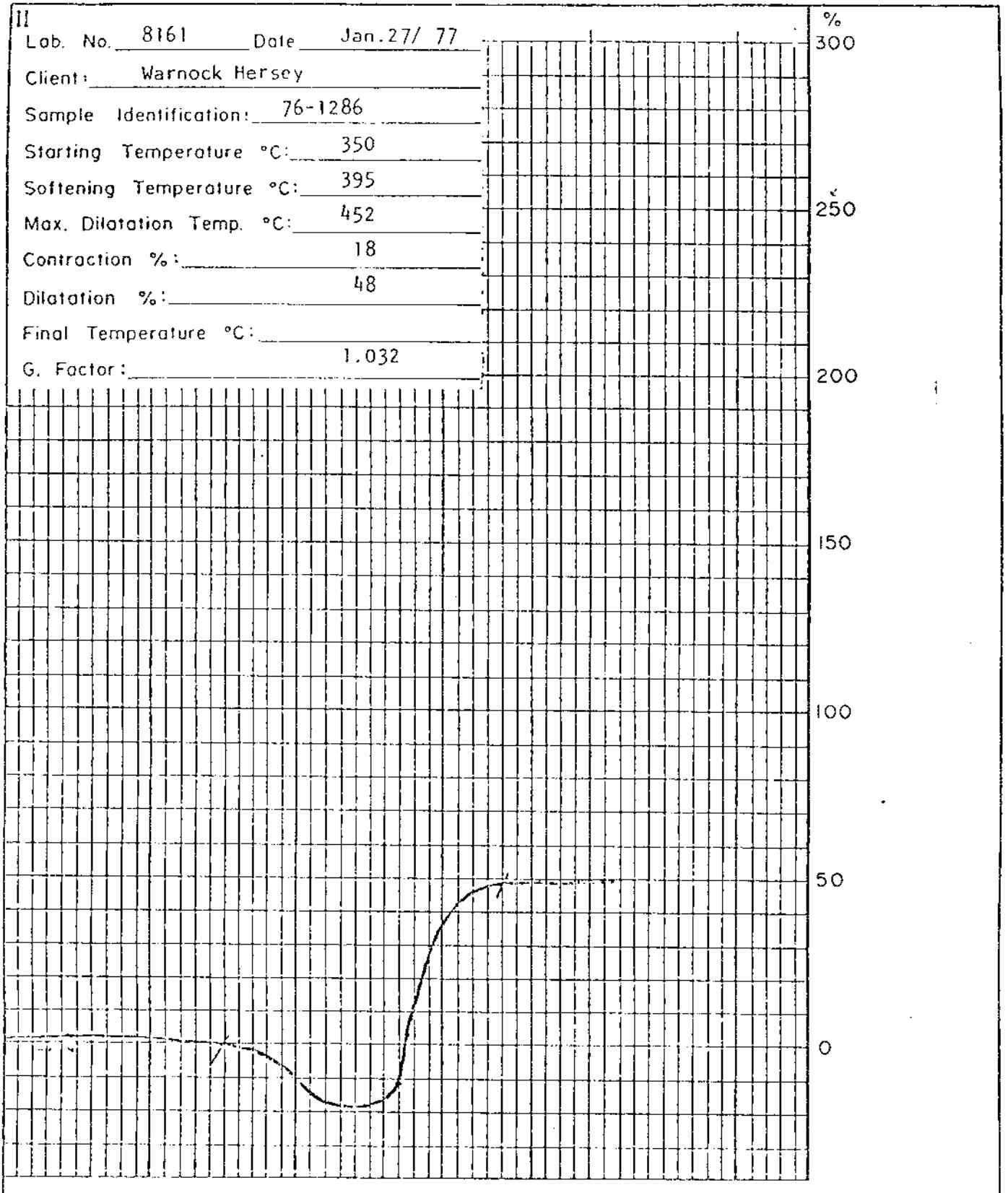
Max. Dilatation Temp. °C: 452

Contraction %: 18

Dilatation %: 48

Final Temperature °C:

G. Factor: 1.032



BIRTLEY ENGINEERING (CANADA) LTD.

Title

RUHR DILATOMETER TEST

Date

Drawn

Warnock Hersey Professional Services Ltd.

ELCO MINING LTD.. Elk River Coal Project 1976-77

DRILL CORE ANALYSIS

Sample Identification: DH 39 - 1 Warnock Hersey Lab. No.: 76 - 1287

TABLE I Raw Coal Head Sample ¼" x 0

AIR DRIED BASIS						% DRY BASIS			
Moist.	Ash	V.M.	F. C.	Sulphur	H.G.I.	Ash	V. M.	F.C.	Sulphur
0.6	33.3	29.6	36.5	0.83	110.0	33.5	29.8	36.7	0.84

TABLE II Screen Analysis

Size	AIR DRIED BASIS				DRY BASIS	
	Weight %	Moisture	ASH	Sulphur	ASH	Sulphur
¼" x 65	71.8	0.7	40.9	0.77	41.2	0.78
65 x 0	28.2	0.8	15.9	0.96	16.0	0.97
TOTAL	100.0	--	--	--	34.1	0.83

TABLE III Float/Sink ¼" x 65 Fraction

Spec. Grav.		AIR DRIED BASIS						DRY BASIS			
Sink	Float	Weight%	Moist.	Ash	V.M.	F.C.	Sulphur	ASH	V.M.	F.C.	Sulphur
	1.40	42.0	0.9	4.1	24.1	70.9	0.71	4.1	24.3	71.6	0.72
1.40	1.50	5.8	0.8	15.4	21.2	62.6	0.72	15.6	21.4	63.0	0.73
1.50	1.60	2.5	0.7	28.2	17.8	53.3	0.54	28.4	18.0	53.6	0.54
1.60		49.7	---	--	--	--	--	75.5	--	--	--
TOTAL		100.0	--	--	--	--	--	40.8	--	--	--

TABLE IV Cumulative 1.60 Float

F.S.I.	Phosphorus (in coal)	DILATATION					
		TEMPERATURE °C			PER CENT		"G" FACTOR
		Initial	Softening	Maximum Dilatation	Maximum Contraction	Maximum Dilatation	
7	0.026	350°C	387°C	445°C	21%	18%	.995

J

Lab. No. 8162 Date Jan. 27/77

Client: Warnock Hersey

Sample Identification: 76-1287

Starting Temperature °C: 350

Softening Temperature °C: 387

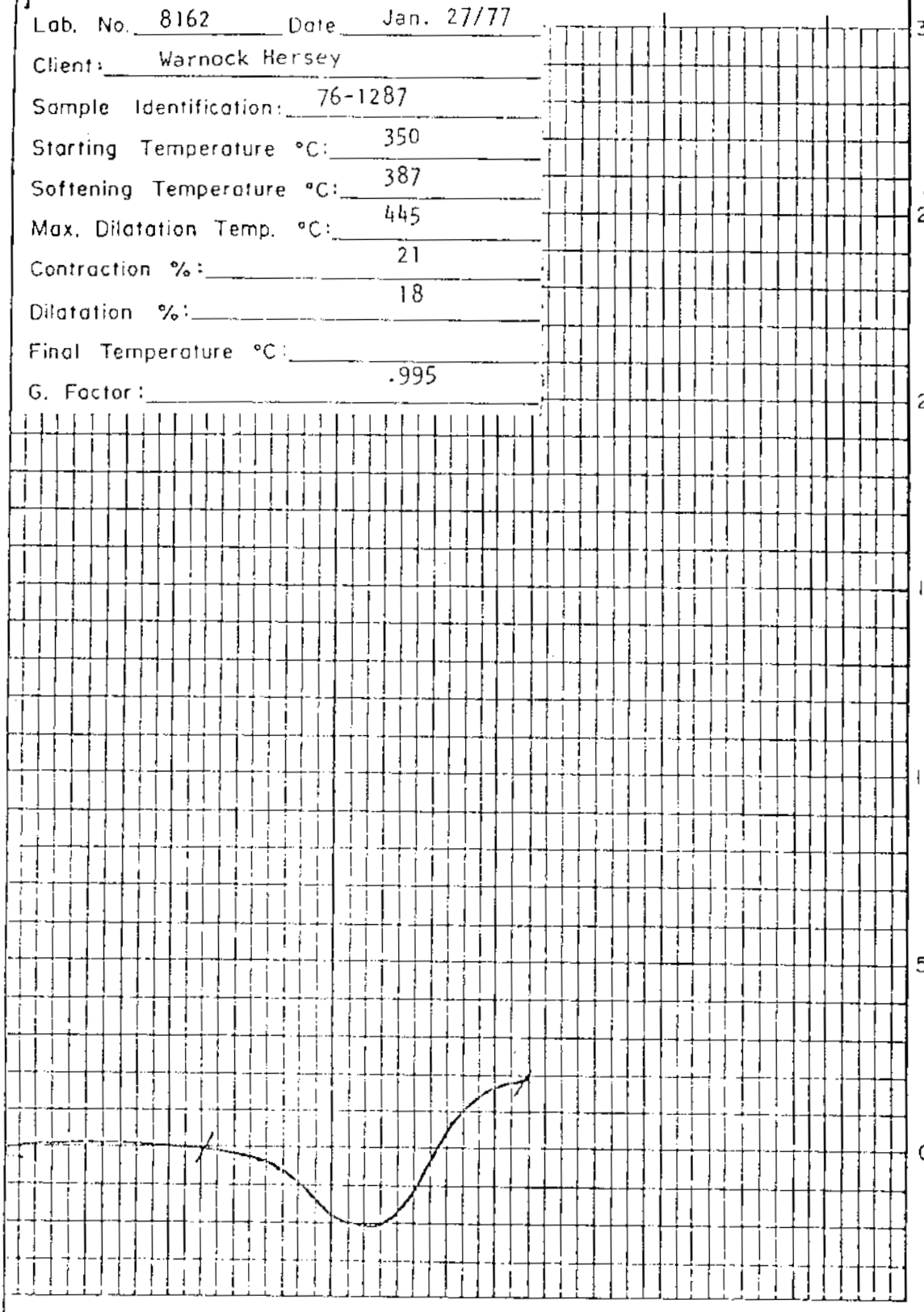
Max. Dilatation Temp. °C: 445

Contraction %: 21

Dilatation %: 18

Final Temperature °C:

G. Factor: .995



BIRTLEY ENGINEERING (CANADA) LTD.

Title

RUHR DILATOMETER TEST

Date

Drawn

Warnock Hersey Professional Services Ltd.

ELCO MINING LTD.. Elk River Coal Project 1976-77

DRILL CORE ANALYSIS

Sample Identification: DH 39 - 2 Warnock Hersey Lab. No.: 76 - 1288

TABLE I Raw Coal Head Sample ¼" x 0

AIR DRIED BASIS						% DRY BASIS			
Moist.	Ash	V.M.	F. C.	Sulphur	H.G. I.	Ash	V. M.	F.C.	Sulphur
0.7	23.0	20.0	56.3	0.66	120.0	23.2	20.1	56.7	0.66

TABLE II Screen Analysis

	AIR DRIED BASIS				DRY BASIS	
Size	Weight %	Moisture	ASH	Sulphur	ASH	Sulphur
¼" x 65	75.4	0.6	25.0	0.66	25.2	0.66
65 x 0	24.6	0.7	14.7	0.76	14.8	0.76
TOTAL	100.0	--	--	--	22.6	0.68

TABLE III Float/Sink ¼" x 65 Fraction

Spec. Grav.		AIR DRIED BASIS						DRY BASIS			
Sink	Float	Weight%	Moist.	Ash	V.M.	F.C.	Sulphur	ASH	V.M.	F.C.	Sulphur
	1.40	59.8	0.7	4.5	23.2	71.6	1.09	4.6	23.4	72.0	0.80
1.40	1.50	7.7	0.7	16.0	20.8	62.5	0.75	16.1	20.9	63.0	0.76
1.50	1.60	5.4	0.7	24.5	18.6	56.2	0.66	24.7	18.7	56.6	0.66
1.60		27.1	--	--	--	--	--	69.2	--	--	--
TOTAL		100.0	--	--	--	--	--	24.1	--	--	--

TABLE IV Cumulative 1.60 Float

F.S.I.	Phosph-orus (in coal)	DILATATION					
		TEMPERATURE °C			PER CENT		"G" FACTOR
		Initial	Softening	Maximum Dilatation	Maximum Contraction	Maximum Dilatation	
7½	0.021	350°C	386°C	443°C	20%	27%	1.010

II

Lab. No. 8163 Date Jan. 27/77

Client: Warnock Hersey

Sample Identification: 76-1288

Starting Temperature °C: 350

Softening Temperature °C: 386

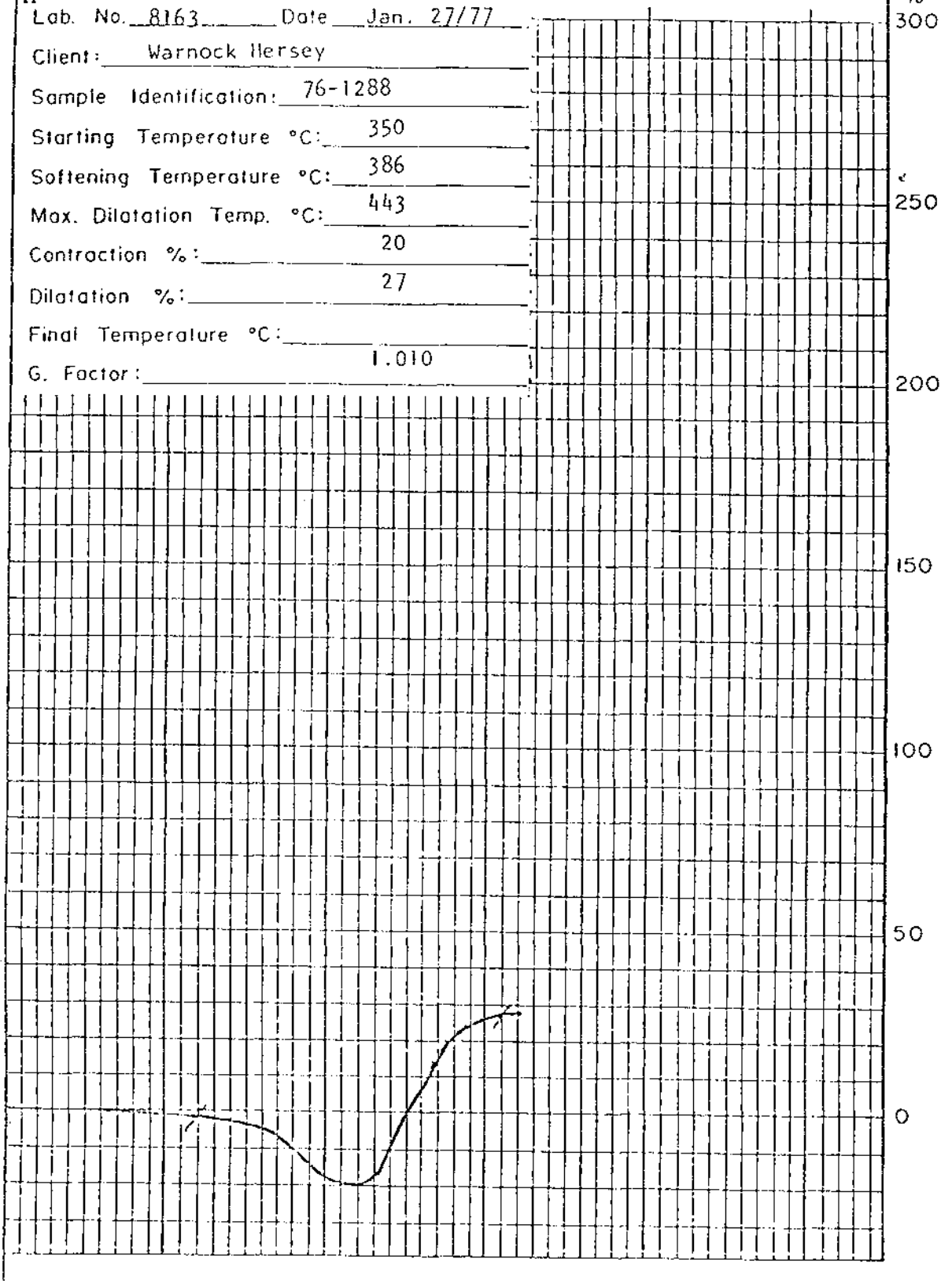
Max. Dilatation Temp. °C: 443

Contraction %: 20

Dilatation %: 27

Final Temperature °C:

G. Factor: 1.010



BIRTLEY ENGINEERING (CANADA) LTD.

Title	Date
RUHR DILATOMETER TEST	
	Drawn

Warnock Hersey Professional Services Ltd.

ELCO MINING LTD.. Elk River Coal Project 1976-77

DRILL CORE ANALYSIS

Sample Identification- DH 39 - 3 Warnock Hersey Lab. No.: 76 - 1289

TABLE I Raw Coal Head Sample ¼" x 0

AIR DRIED BASIS						% DRY BASIS			
Moist.	Ash	V.M.	F. C.	Sulphur	H.G.I.	Ash	V. M.	F.C.	Sulphur
0.6	18.7	18.9	61.8	0.45	87.8	18.8	19.1	62. 1	0.45

TABLE II Screen Analysis

	AIR DRIED BASIS				DRY BASIS	
Size	Weight %	Moisture	ASH	Sulphur	ASH	Sulphur
¼" x 65	83.5	0.5	20.6	0.43	20.7	0.43
65 x 0	16.5	0.6	14.0	0.52	14.1	0.52
TOTAL	100.0	- - -	- -	- -	19.6	0.44

TABLE III Float/Sink ¼" x 65 Fraction

Spec. Grav.		AIR DRIED BASIS						DRY BASIS			
Sink	Float	Weight%	Moist.	Ash	V.M.	F.C.	Sulphur	ASH	V.M.	F C.	Sulphur
	1.40	69.3	0.7	4.8	21.8	72.7	0.55	4.9	21.9	73.2	0.55
1.40	1.50	7.7	0.6	13.9	19.6	65.9	0.50	14.0	19.7	66.3	0.50
1.50	1.60	3.5	0.6	23.0	17.2	59.2	0.45	23.1	17.3	59.6	0.45
1.60		19.5	- -	- -	- -	- -	- -	71.6	- -	- -	- -
TOTAL		100.0	- -	- -	- -	- -	- -	19.2	- -	- -	- -

TABLE IV Cumulative 1.60 Float

F.S.I.	Phosphorus (in coal)	DILATATION					
		TEMPERATURE °C			PER CENT		"G" FACTOR
		Initial	Softening	Maximum Dilatation	Maximum Contraction	Maximum Dilatation	
5½	0.012	350°C	398°C	- - -	14% @ 437°	c - -	- - -

Lab. No. 8164 Date Jan. 27/77

Client: Warnock Hersey

Sample Identification: 76-1289

Starting Temperature °C: 350

Softening Temperature °C: 398

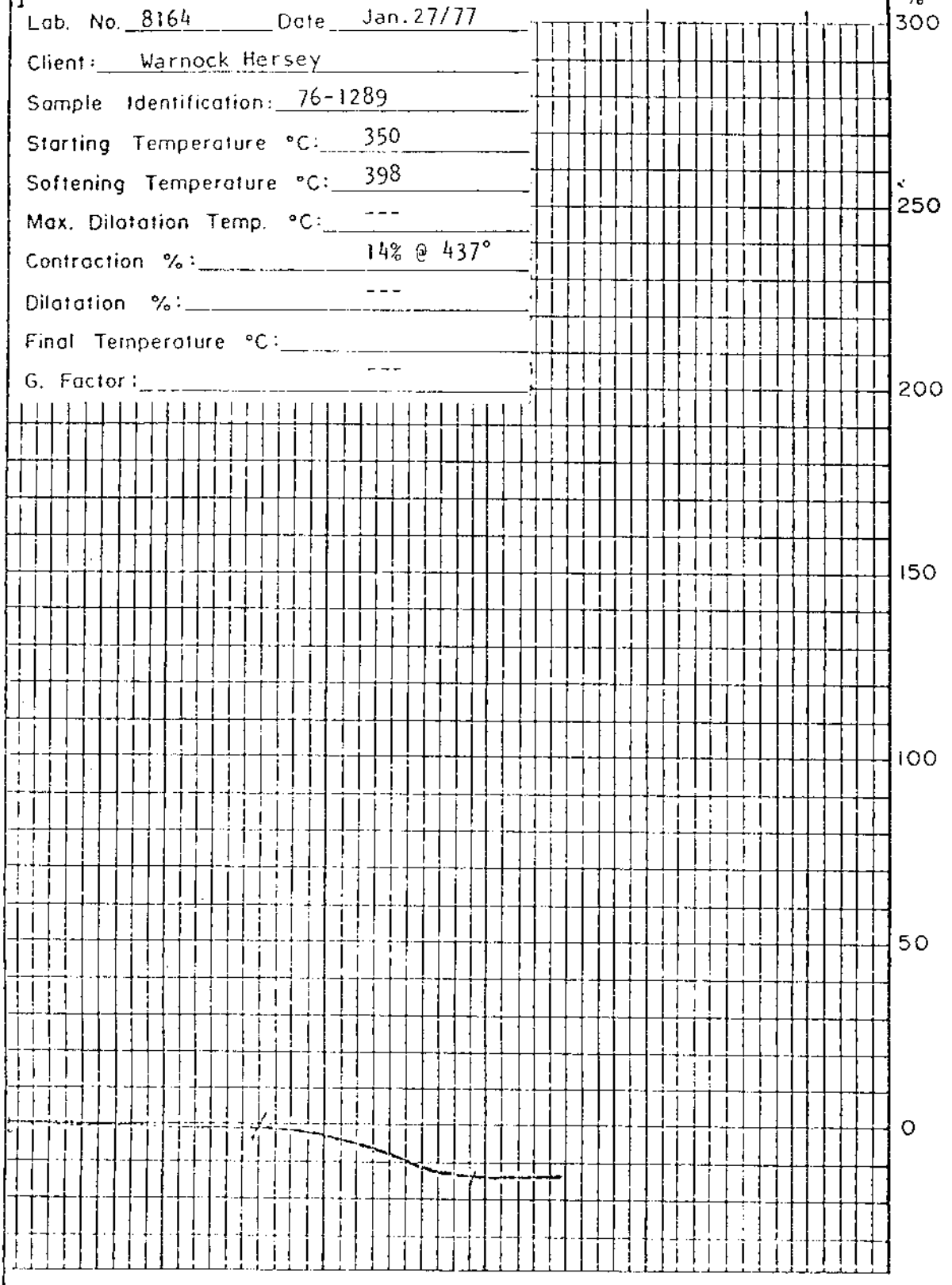
Max. Dilatation Temp. °C: ---

Contraction %: 14% @ 437°

Dilatation %: ---

Final Temperature °C:

G. Factor: ---



BIRTLEY ENGINEERING (CANADA) LTD.

Title	Date
RUHR DILATOMETER TEST	
	Drawn

Warnock Hersey Professional Services Ltd.

ELCO MINING LTD.. Elk River Coal Project 1976-77

DRILL CORE ANALYSIS

Sample Identification: DH 39 - 4 Warnock Hersey Lab. No.: 76 - 1290

TABLE I Raw Coal Head Sample ¼" x 0

AIR DRIED BASIS						% DRY BASIS			
Moist.	Ash	V.M.	F. C.	Sulphur	H.G. I.	Ash	V. M.	F.C.	Sulphur
0.4	17.0	18.3	64.3	0.48	90.6	17.0	18.4	64.6	0.48

TABLE II Screen Analysis

	AIR DRIED BASIS				DRY BASIS	
Size	Weight %	Moisture	ASH	Sulphur	ASH	Sulphur
¼" x 65	83.2	0.5	17.2	0.44	17.3	0.44
65 x 0	16.8	0.5	11.2	0.53	11.3	0.53
TOTAL	100.0	--	--	--	16.3	0.46

TABLE III Float/Sink ¼" x 65 Fraction

Spec. Grav.		AIR DRIED BASIS						DRY BASIS			
Sink	Float	Weight%	Moist.	Ash	V.M.	F.C.	Sulphur	ASH	V.M.	F.C.	Sulphur
	1.40	67.8	0.6	4.9	20.4	74.1	0.53	4.9	20.5	74.6	0.53
1.40	1.50	10.5	0.5	16.2	18.6	64.7	0.47	16.3	18.6	65.1	0.47
1.50	1.60	4.0	0.5	25.1	15.9	58.5	0.39	25.2	16.0	58.8	0.39
1.60		17.7	--	--	--	--	--	63.3	--	--	--
TOTAL		100.0	--	--	--	--	--	17.2	--	--	--

TABLE IV Cumulative 1.60 Float

F.S.I.	Phosphorus (in coal)	DILATATION					
		TEMPERATURE °C			PER CENT		"G" FACTOR
		Initial	Softening	Maximum Dilatation	Maximum Contraction	Maximum Dilatation	
3	0.016	350°C	407°C	---	11% @ 452°	---	---

II

Lab. No. 8165 Date Jan. 27/77

Client: Warnock Hersey

Sample Identification: 76-1290

Starting Temperature °C: 350

Softening Temperature °C: 407

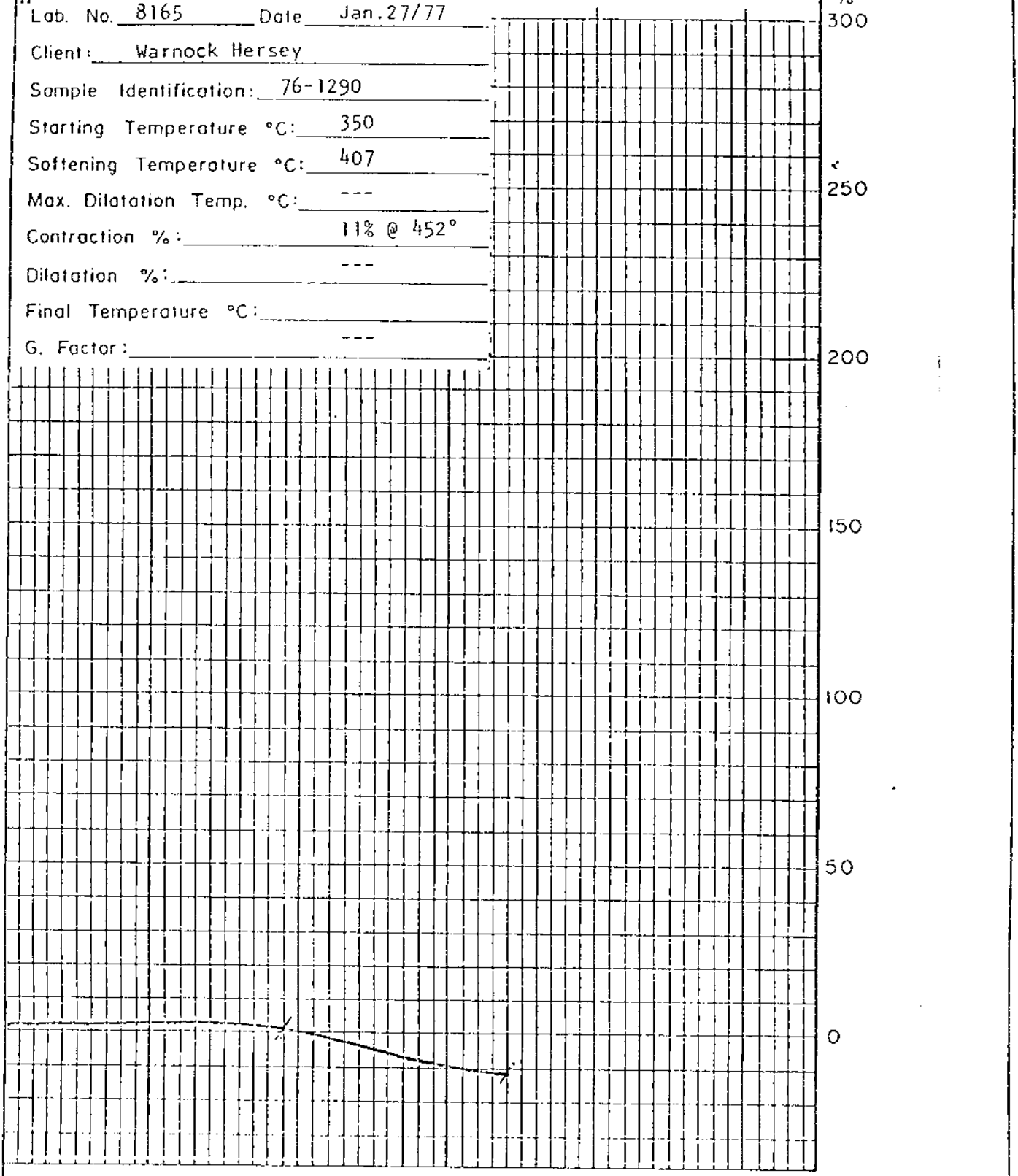
Max. Dilatation Temp. °C: ---

Contraction %: 11% @ 452°

Dilatation %: ---

Final Temperature °C:

G. Factor: ---



BIRTLEY ENGINEERING (CANADA) LTD.

Title

RUHR DILATOMETER TEST

Date

Drawn

Warnock Hersey Professional Services Ltd.

ELCO MINING LTD.. Elk River Coal Project 1976-77

DRILL CORE ANALYSIS

Sample Identification: DH 39 - 5 Warnock Hersey Lab. No.: 76 - 1291

TABLE I Raw Coal Head Sample ¼" x 0

AIR DRIED BASIS						% DRY BASIS			
Moist.	Ash	V.M.	F. C.	Sulphur	H.G.I.	Ash	V. M.	F.C.	Sulphur
0.3	11.1	18.9	69.7	0.72	135.0	11.1	18.9	70.0	0.73

TABLE II Screen Analysis

	AIR DRIED BASIS				DRY BASIS	
Size	Weight %	Moisture	ASH	Sulphur	ASH	Sulphur
¼" x 65	75.8	0.4	11.9	0.63	11.9	0.63
65 x 0	24.2	0.5	5.6	0.79	5.6	0.79
TOTAL	100.0	--	--	--	10.4	0.67

TABLE III Float/Sink ¼" x 65 Fraction

Spec. Grav.		AIR DRIED BASIS						DRY BASIS			
Sink	Float	Weight%	Moist.	Ash	V.M.	F.C.	Sulphur	ASH	V.M.	F.C.	Sulphur
	1.40	73.2	0.5	4.7	21.1	73.7	0.80	4.7	21.2	74.1	0.80
1.40	1.50	11.7	0.7	14.0	18.6	66.7	0.55	14.1	18.7	67.2	0.55
1.50	1.60	5.4	0.5	19.6	16.8	63.1	0.51	20.5	16.9	62.6	0.51
1.60		9.7	--	--	--	--	--	48.8	--	--	--
TOTAL		100.0	--	--	--	--	--	10.9	--	--	--

TABLE IV Cumulative 1.60 Float

F.S.I.	Phosphorus (in coal)	DILATATION					
		TEMPERATURE °C			PER CENT		"G" FACTOR
		Initial	Softening	Maximum Dilatation	Maximum Contraction	Maximum Dilatation	
3½	0.042	350°C	395°C	---	18% @ 469°	---	---

Lab. No. 8166 Date Jan. 27/77

Client: Warnock Hersey

Sample Identification: 76-1291

Starting Temperature °C: 350

Softening Temperature °C: 395

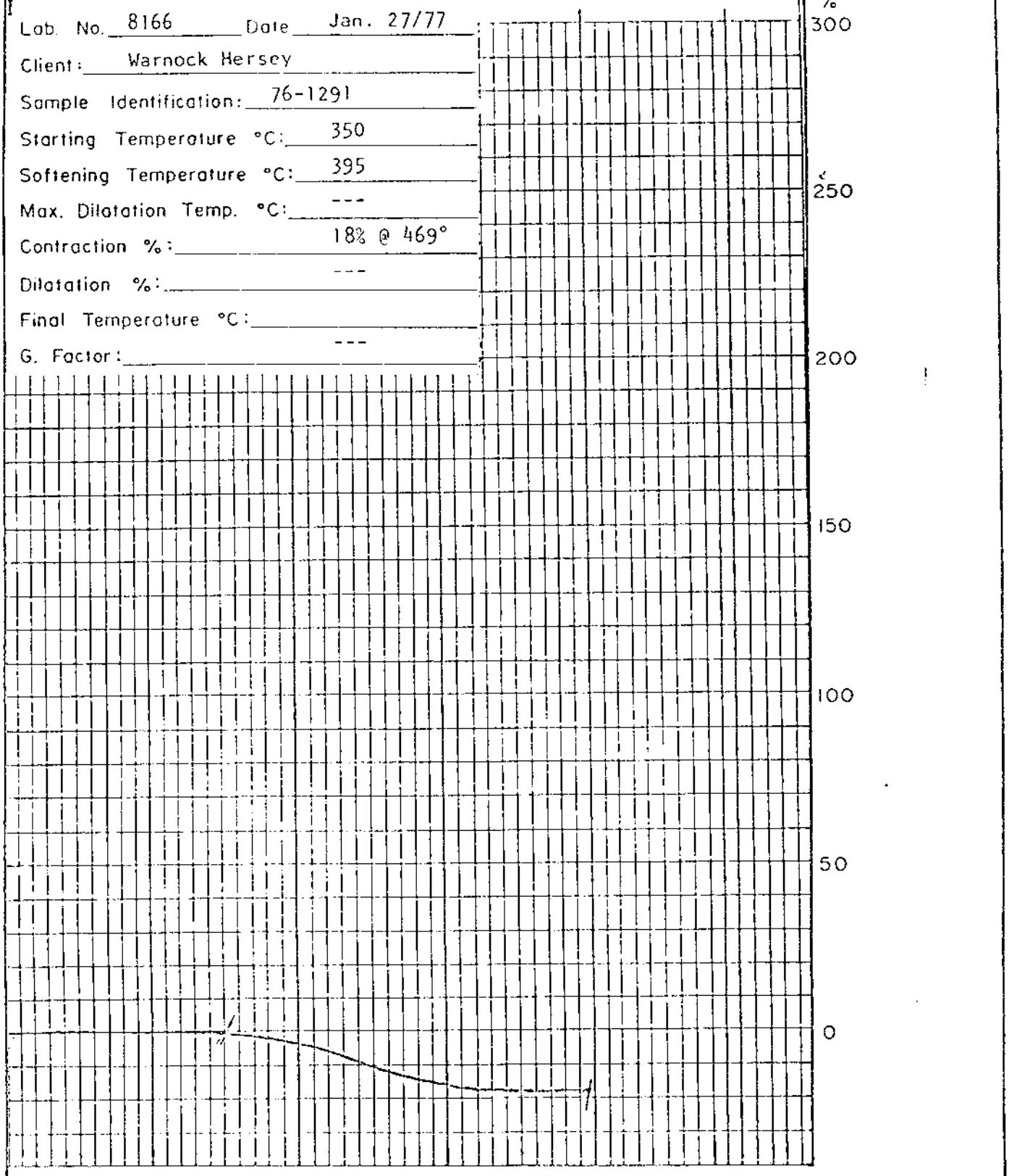
Max. Dilatation Temp. °C: ---

Contraction %: 18% @ 469°

Dilatation %: ---

Final Temperature °C:

G. Factor: ---



BIRTLEY ENGINEERING (CANADA) LTD.

Title	Date
RUHR DILATOMETER TEST	
	Drawn

Lab. No. 8011 Date Jan 16, 1977

Client: ELCO MINING LTD.

Sample Identification: DH-40-1

Starting Temperature °C: 350

Softening Temperature °C: 375

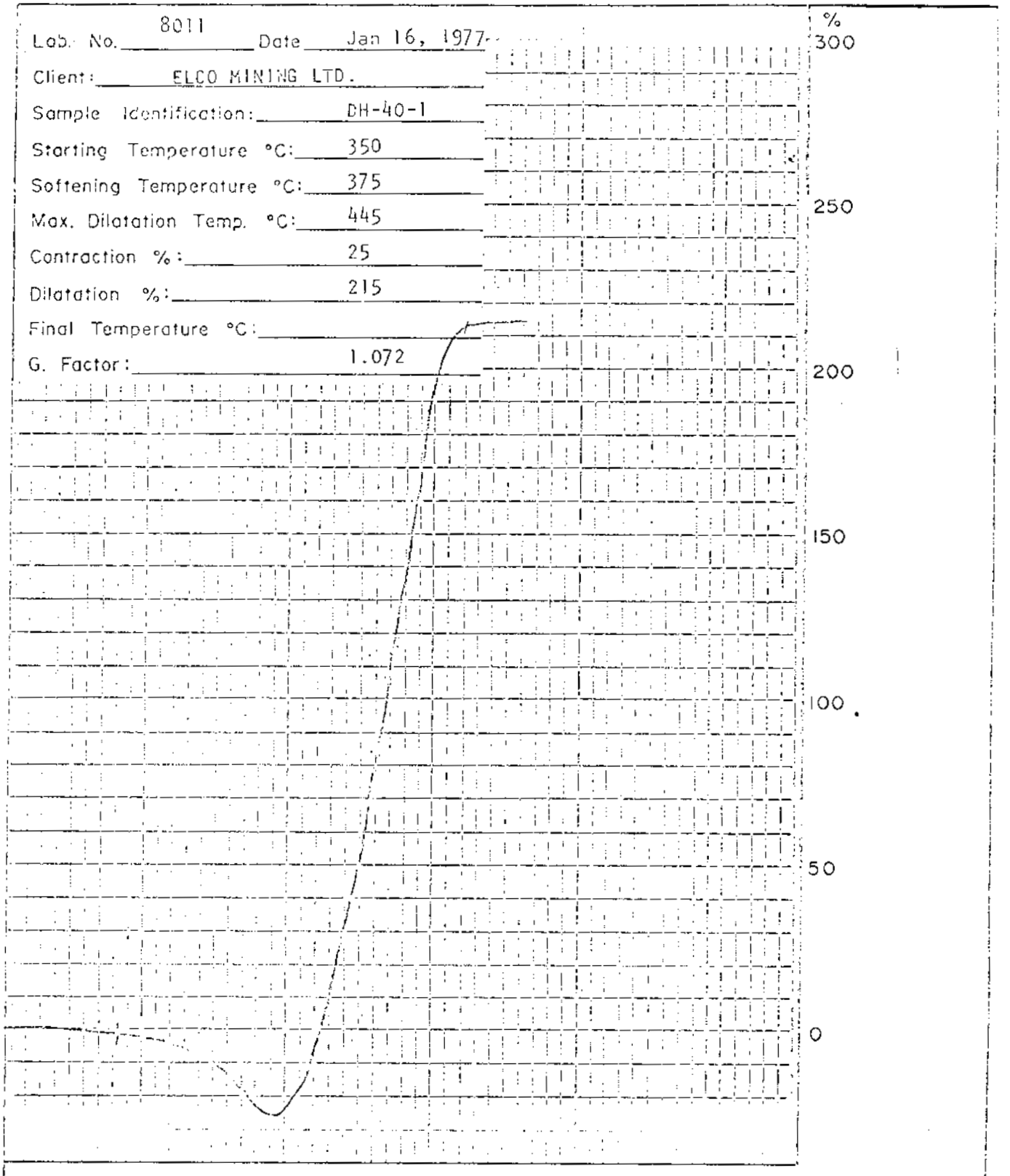
Max. Dilatation Temp. °C: 445

Contraction %: 25

Dilatation %: 215

Final Temperature °C:

G. Factor: 1.072



BARTLEY ENGINEERING (CANADA) LTD.

Title	Date
RUHR DILATOMETER TEST	
	Drawn

Lab. No. 8012 Date Jan 16, 1977

Client: ELCO MINING LTD.

Sample Identification: DH-40-2

Starting Temperature °C: 350

Softening Temperature °C: 383

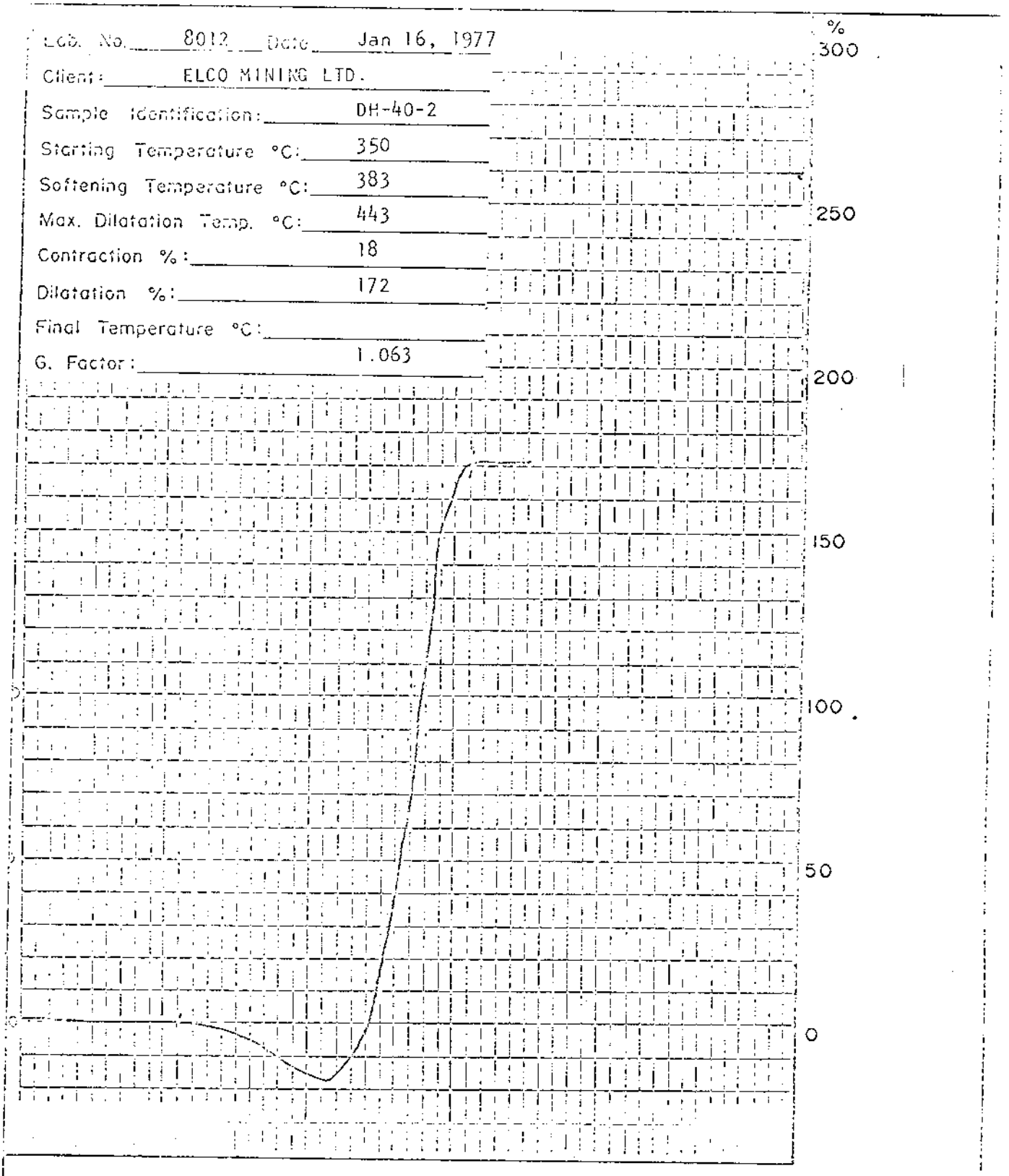
Max. Dilatation Temp. °C: 443

Contraction %: 18

Dilatation %: 172

Final Temperature °C:

G. Factor: 1.063



BARTLEY ENGINEERING (CANADA) LTD.

Title

RUHR DILATOMETER TEST

Date

Drawn

Lab. No. 8013 Date Jan 16, 1977

Client: ELCO MINING LTD.

Sample Identification: DH-40-3

Starting Temperature °C: 350

Softening Temperature °C: 372

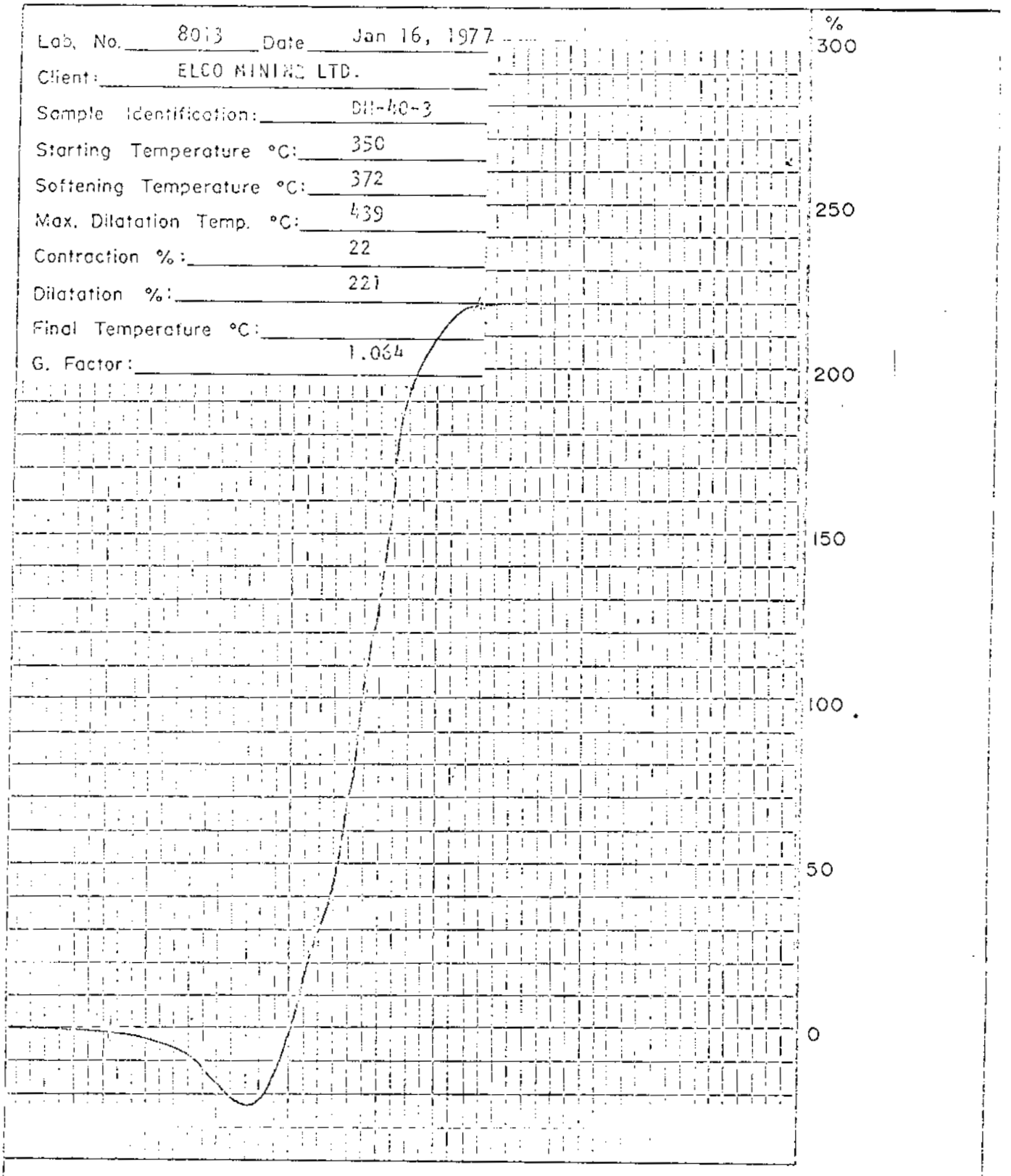
Max. Dilatation Temp. °C: 439

Contraction %: 22

Dilatation %: 221

Final Temperature °C:

G. Factor: 1.064



DIRTLEY ENGINEERING (CANADA) LTD.

Title	Date
RUHR DILATOMETER TEST	
	Drawn

Lab. No. 8063 Date Jan 16, 1977

Client: ELCO MINING LTD.

Sample Identification: DH-40-4

Starting Temperature °C: 350

Softening Temperature °C: 376

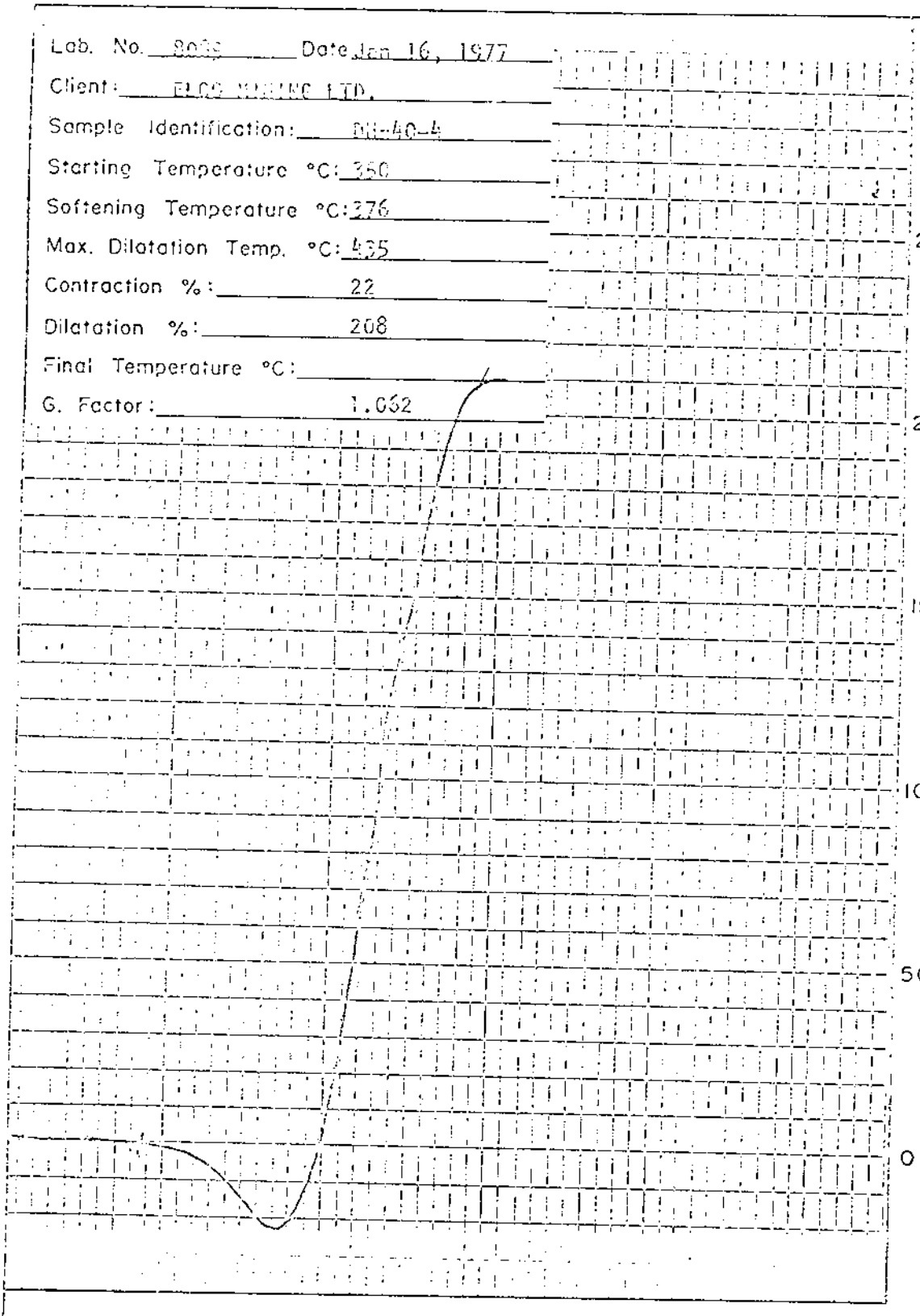
Max. Dilatation Temp. °C: 435

Contraction %: 22

Dilatation %: 208

Final Temperature °C:

G. Factor: 1.062



BIRTLEY ENGINEERING (CANADA) LTD.

Title	Date
RUHR DILATOMETER TEST	
	Drawn

Lab. No. 8014 Date Jan 16, 1977

Client: ELCO MINING LTD.

Sample Identification: DH-40-5

Starting Temperature °C: 350

Softening Temperature °C: 374

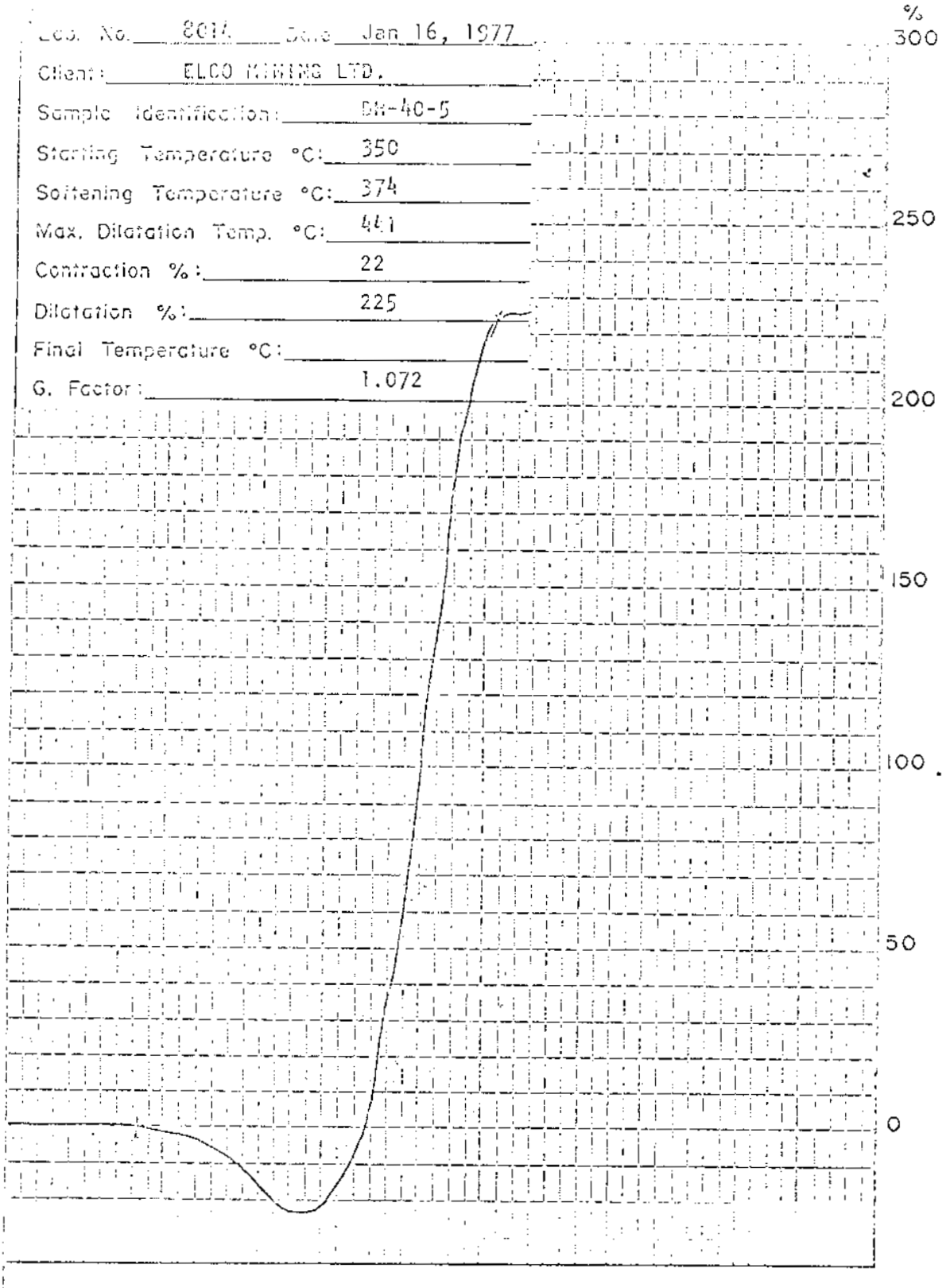
Max. Dilatation Temp. °C: 441

Contraction %: 22

Dilatation %: 225

Final Temperature °C:

G. Factor: 1.072



DIRTLEY ENGINEERING (CANADA) LTD.

Title

RUHR DILATOMETER TEST

Date

Drawn

Lab. No. 2015 Date Jan. 16, 1977

Client: ELCO MINING LTD.

Sample Identification: DH-40-6

Starting Temperature °C: 350

Softening Temperature °C: 381

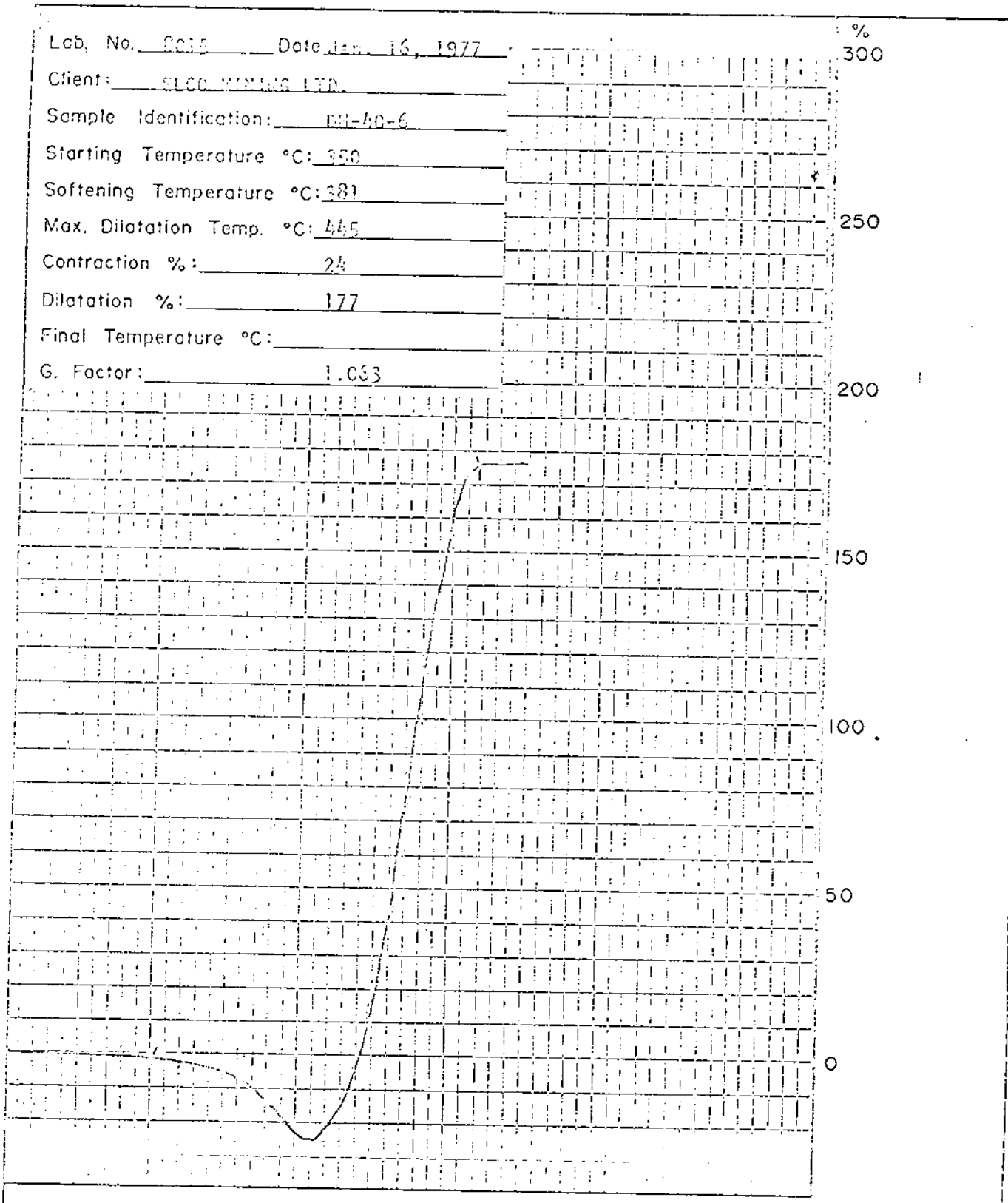
Max. Dilatation Temp. °C: 445

Contraction %: 24

Dilatation %: 177

Final Temperature °C:

G. Factor: 1.063



BIRTLEY ENGINEERING (CANADA) LTD.

Title

RUHR DILATOMETER TEST

Date

Drawn

Lab. No. 2016 Date Jan 16, 1977

Client: ELCO MINING LTD.

Sample Identification: DH-40-7

Starting Temperature °C: 350

Softening Temperature °C: 377

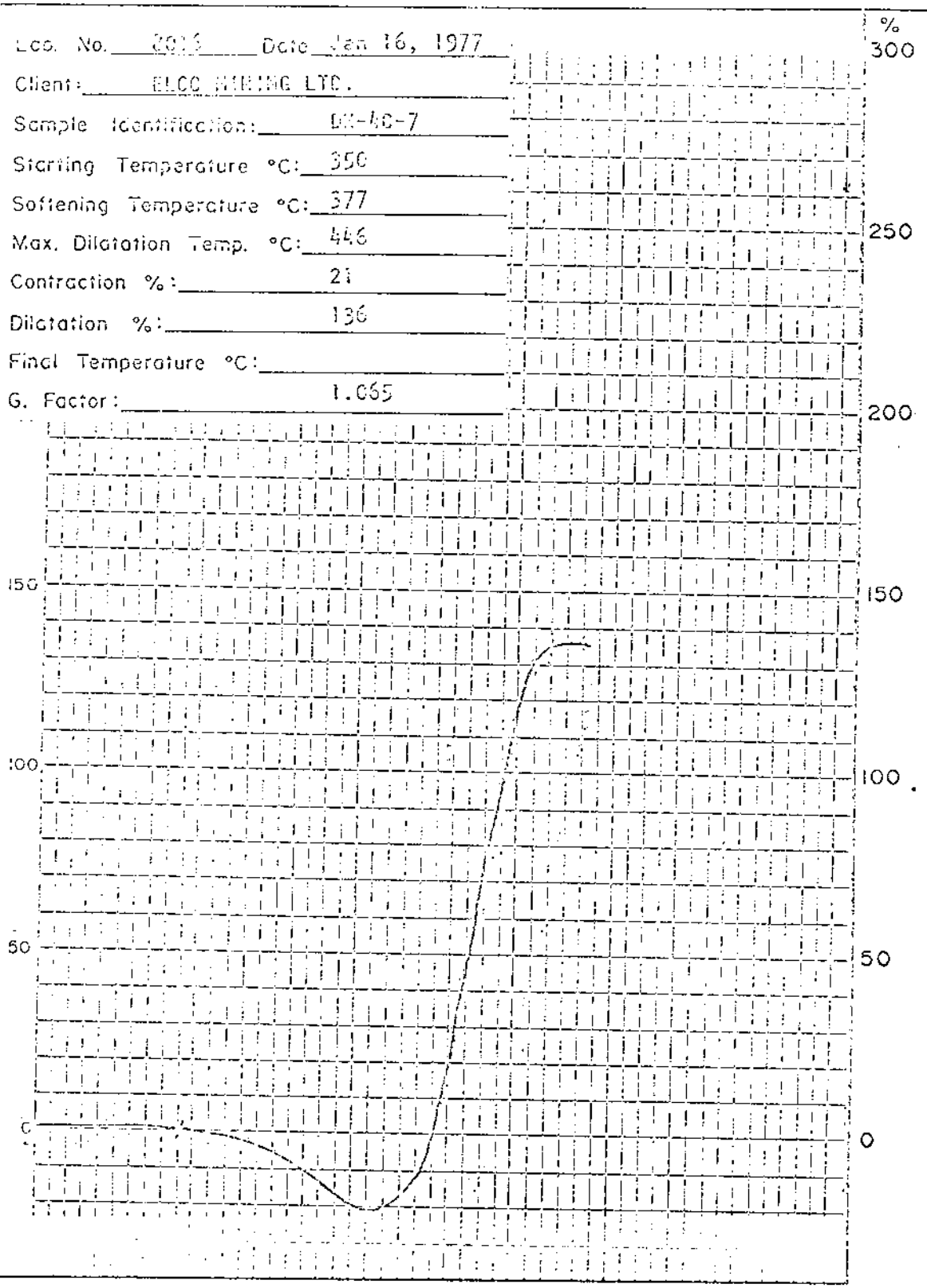
Max. Dilatation Temp. °C: 446

Contraction %: 21

Dilatation %: 136

Final Temperature °C:

G. Factor: 1.065



BARTLEY ENGINEERING (CANADA) LTD.

Title	Date
RUHR DILATOMETER TEST	
	Drawn

Lab. No. 6617 Date Jan. 16, 1977

Client: ELCO MINING LTD.

Sample Identification: DR-40-8

Starting Temperature °C: 350

Softening Temperature °C: 368

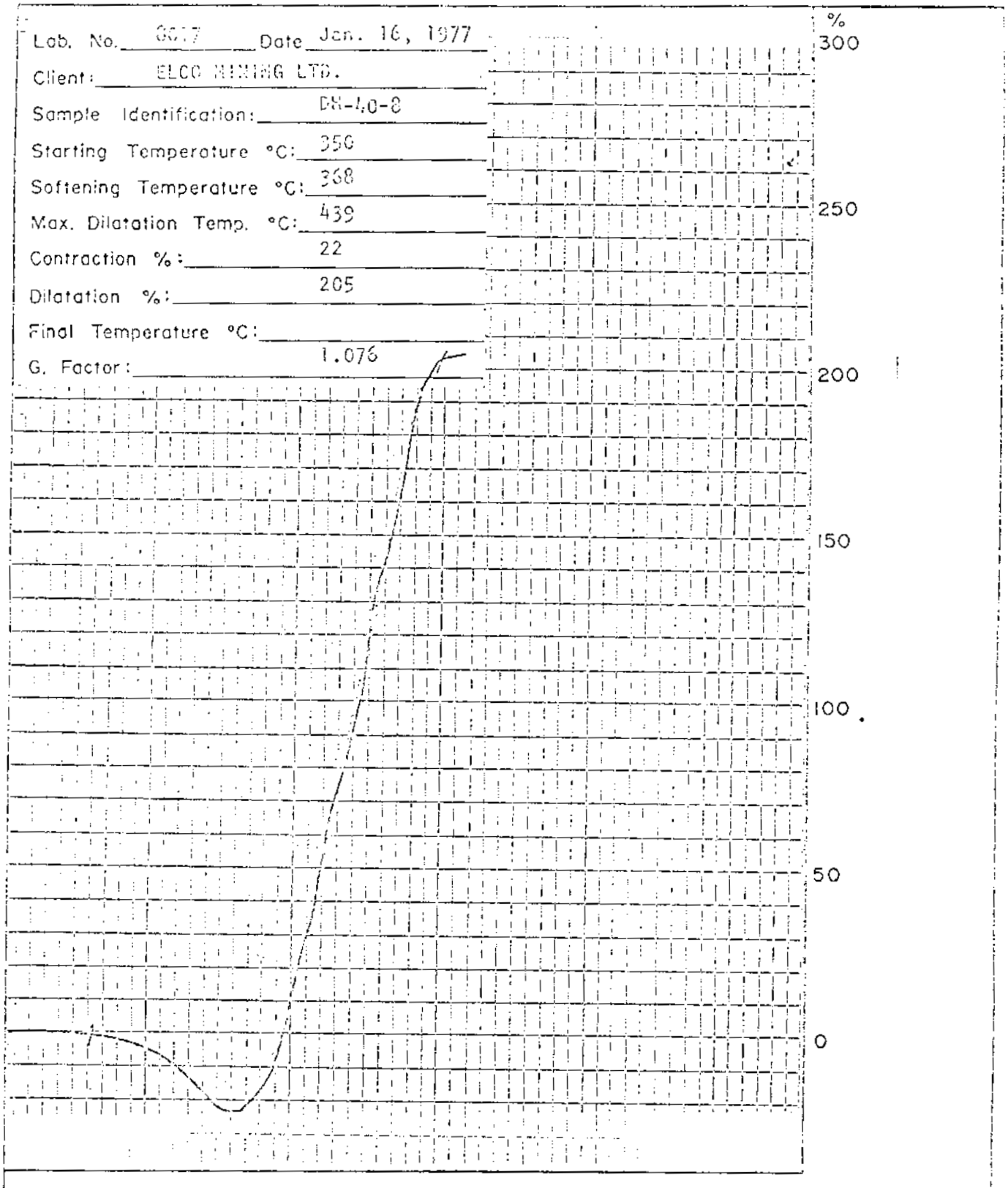
Max. Dilatation Temp. °C: 439

Contraction %: 22

Dilatation %: 205

Final Temperature °C:

G. Factor: 1.076



BIRTLEY ENGINEERING (CANADA) LTD.

Title

RUHR DILATOMETER TEST

Date

Drawn

Lab. No. 8010 Date Jan. 16, 1977

Client: ELCO MINING LTD.

Sample Identification: DH-40-9

Starting Temperature °C: 350

Softening Temperature °C: 383

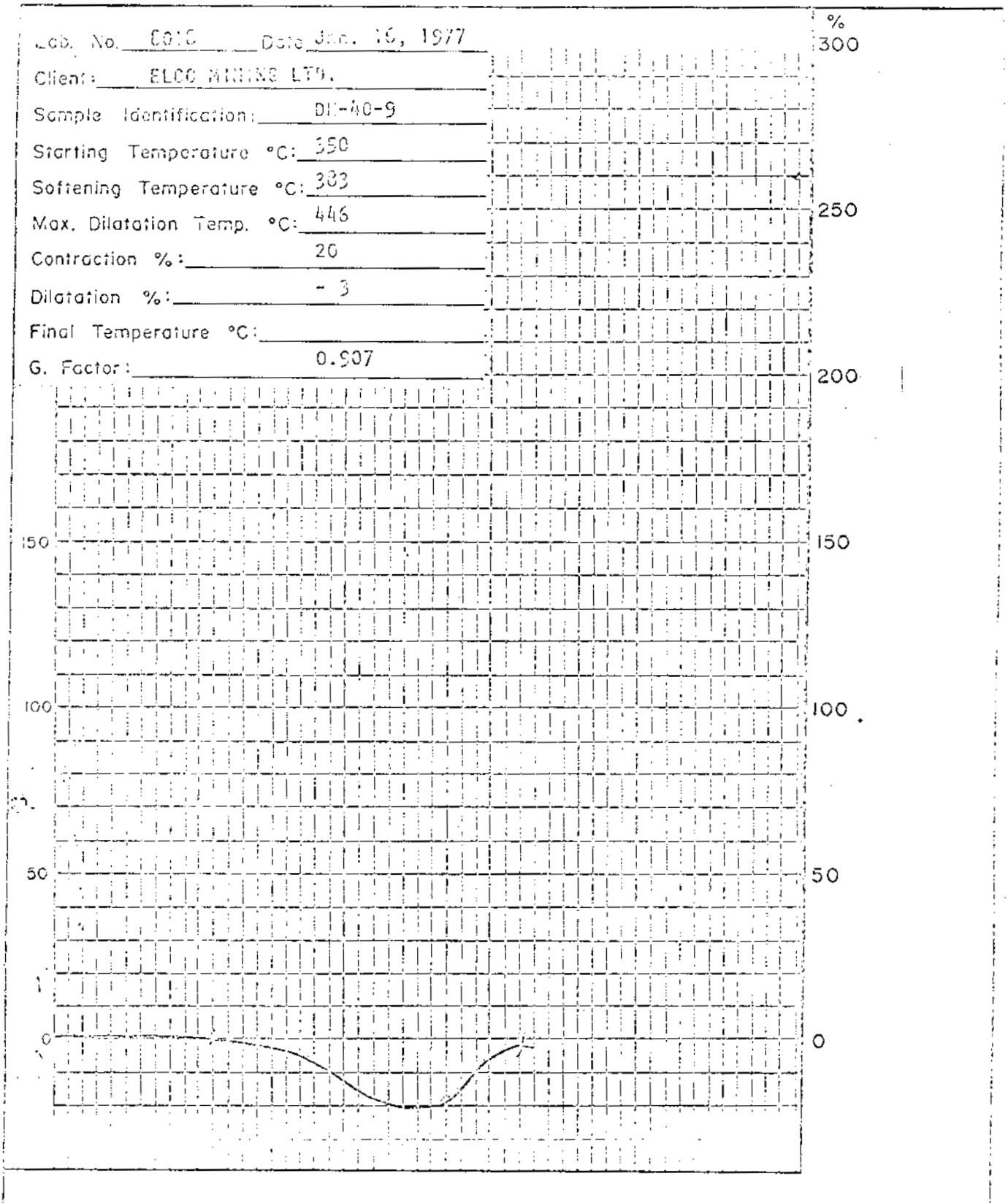
Max. Dilatation Temp. °C: 446

Contraction %: 20

Dilatation %: - 3

Final Temperature °C:

G. Factor: 0.907



BARTLEY ENGINEERING (CANADA) LTD.

Title	Date
RUHR DILATOMETER TEST	
	Drawn

Lab. No. 8015 Date Jan 16, 1977

Client: ELCO MINING LTD.

Sample Identification: DH-40-10

Starting Temperature °C: 350

Softening Temperature °C: 381

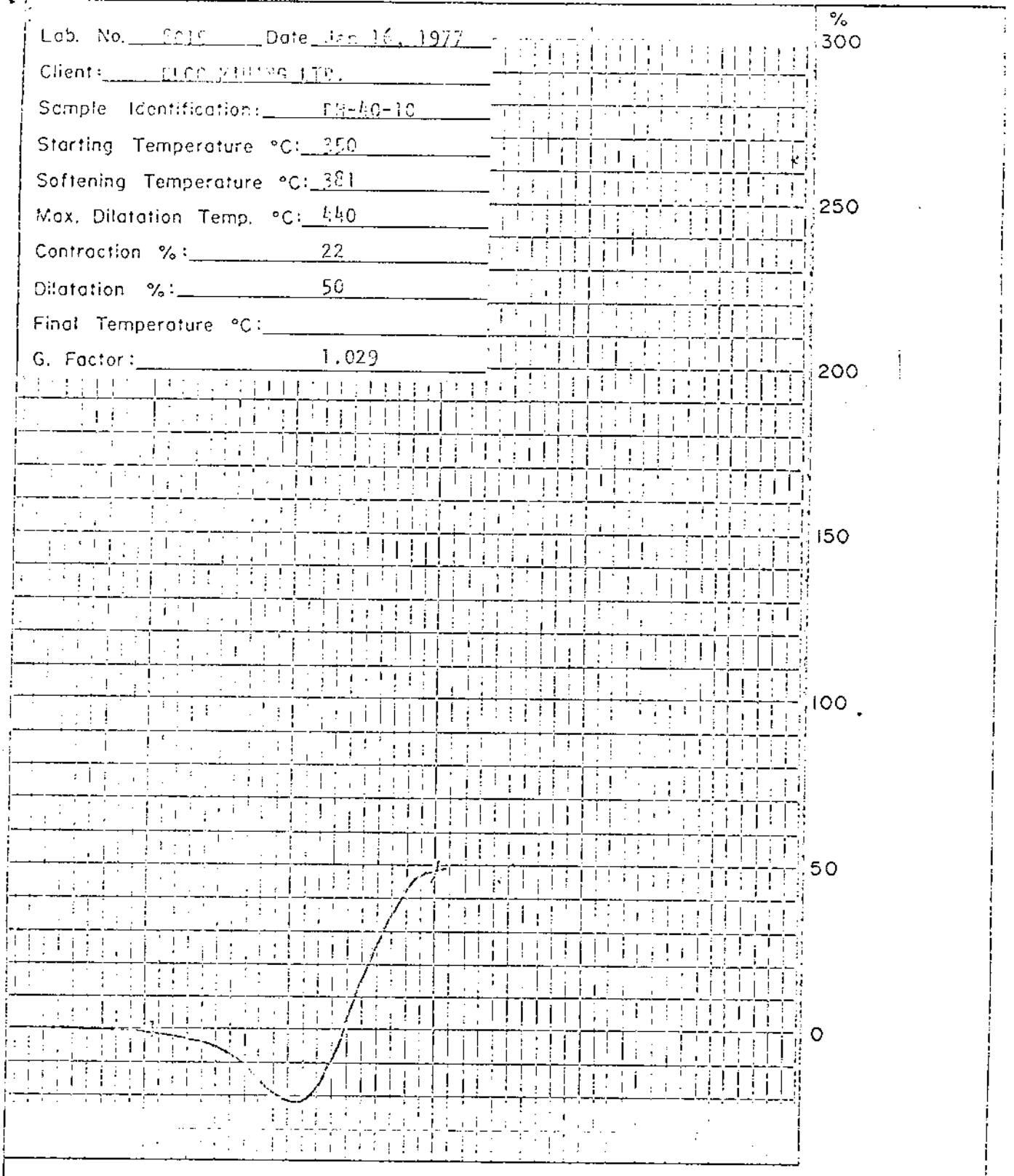
Max. Dilatation Temp. °C: 440

Contraction %: 22

Dilatation %: 50

Final Temperature °C:

G. Factor: 1.029



BIRTLEY ENGINEERING (CANADA) LTD.

Title

RUHR DILATOMETER TEST

Date

Drawn