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MateriaLab

REPORT ON FIBRE CEMENT BOARD

Client : Promat International (Asia Pacific) Limited
Project : Physical Test of Building Boards
Client Ref. : --
Report No. : 041823ST50194
Date : 13 June 2005

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Client Ref. : --
Report No. : 041823ST50194

Page 1 of 28

REPORT ON DETERMINATION OF THICKNESS OF FIBRE CEMENT BOARD**Information Supplied by Client**

Client : Promat International (Asia Pacific) Limited
Project : Physical Test of Building Boards
Sample Description : Eterpan MD Fibre Cement Board
Size : 100 x 100mm
Nominal Thickness : 9mm



Laboratory Information

Lab. Sample I.D. : ST50194/1-6
Date Received : 17 February 2005
Date Tested : 15 March 2005
Test Method : BS 5669 : Part 1 : 1989, Clause 7.2

Test Results

Lab Sample I.D.	Thickness (mm)				
	A	B	C	D	Average
ST50194/1	9.23	9.26	9.23	9.22	9.22
ST50194/2	9.05	8.92	8.82	8.96	8.96
ST50194/3	9.21	9.20	9.16	9.14	9.14
ST50194/4	9.04	9.03	9.02	9.04	9.04
ST50194/5	9.09	9.08	9.04	9.03	9.03
ST50194/6	9.09	9.13	9.10	9.13	9.13

Remark : The test results relate only to the samples tested.

Checked by :  Date : 13-6-2005 Certified by :  Date : 15/6/05
Gary Winstanley

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 Report No. : 041823ST50194

Page 2 of 28

**REPORT ON DETERMINATION OF INCREASE IN MASS (WATER ABSORPTION)
 AND THICKNESS (SEWLLING) OF FIBRE CEMENT BOARD DUE TO GENERAL
 ABSORPTION OF WATER**

Information Supplied by Client

Client : Promat International (Asia Pacific) Limited
 Project : Physical Test of Building Boards
 Sample Description : Eterpan MD Fibre Cement Board
 Size : 100 x 100mm
 Nominal Thickness : 9mm

Laboratory Information


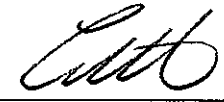
Lab. Sample I.D. : ST50194/7-12
 Date Received : 17 February 2005
 Date Test Started : 15 March 2005
 Date Test Completed : 16 March 2005
 Test Method : BS 5669 : Part 1 : 1989, Clause 19

Test Results

Lab. Sample I.D.	Mass of Sample Before Immersion (g)	Mass of Sample After Immersion for 24 hours (g)	Water Absorption (%)
ST50194/7	125.27	149.40	19.26
ST50194/8	126.15	150.38	19.21
ST50194/9	126.48	149.77	18.41
ST50194/10	126.25	147.70	16.99
ST50194/11	125.08	147.53	17.95
ST50194/12	124.67	150.23	20.50
		Average	18.72

Lab. Sample I.D.	Mean Thickness of Sample Before Immersion (mm)	Mean Thickness of Sample After Immersion for 24 hours (mm)	Swelling (%)
ST50194/7	9.21	9.24	0.33
ST50194/8	9.07	9.11	0.44
ST50194/9	9.16	9.18	0.22
ST50194/10	9.11	9.13	0.22
ST50194/11	8.90	8.90	0.00
ST50194/12	9.05	9.06	0.11
		Average	0.22

Remark : The test results relate only to the samples tested.

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 Report No. : 041823ST50194

Page 3 of 28

**REPORT ON DETERMINATION OF CHANGE IN LENGTH, THICKNESS
 AND MASS OF FIBRE CEMENT BOARD AFTER CONDITIONING AT 35% R.H
 AND 85% R.H.**

Information Supplied by Client

Client : Promat International (Asia Pacific) Limited
 Project : Physical Test of Building Boards
 Sample Description : Eterpan MD Fibre Cement Board
 Size : 200 x 13mm
 Nominal Thickness : 9mm

Laboratory Information

Lab. Sample I.D. : ST50194/13-18
 Date Received : 17 February 2005
 Date Test Started : 17 March 2005
 Date Test Completed : 07 April 2005
 Test Method : BS 5669 : Part 1 : 1989, Clause 20



Test Results

Lab. Sample I.D.	Condition	Reading of Dial Gauge (div)	Change in Length (%)
ST50194/13	20°C ± 2°C, 65 ± 5% r.h.	2609	0
	25°C ± 2°C, 35 ± 5% r.h.	2609	
ST50194/14	25°C ± 2°C ; 35 ± 5% r.h.	2595	+0.04
	25°C ± 2°C, 85 ± 5% r.h.	2603	

Lab. Sample I.D.	Condition	Thickness of Sample (mm)			Change In Thickness (%)
ST50194/15	20°C ± 2°C ; 65 ± 5% r.h.	9.048	9.179	9.114	-0.05
	25°C ± 2°C ; 35 ± 5% r.h.	9.040	9.178	9.109	
ST50194/16	20°C ± 2°C ; 65 ± 5% r.h.	9.112	8.991	18.103	+0.07
	25°C ± 2°C ; 85 ± 5% r.h.	9.117	8.999	18.116	

Lab. Sample I.D.	Condition	Mass of Sample (g)	Change in Mass (%)
ST50194/17	20°C ± 2°C, 65 ± 5% r.h.	30.35	-1.22
	25°C ± 2°C ; 35 ± 5% r.h.	29.98	
ST50194/18	20°C ± 2°C, 65 ± 5% r.h.	30.82	+2.79
	25°C ± 2°C ; 85 ± 5% r.h.	31.68	

Remark : The test results relate only to the samples tested.

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Page 4 of 28

REPORT ON DETERMINATION OF DENSITY OF FIBRE CEMENT BOARD**Information Supplied by Client**

Client : Promat International (Asia Pacific) Limited
 Project : Physical Test of Building Boards
 Sample Description : Eterpan MD Fibre Cement Board
 Size : 100 x 100mm
 Nominal Thickness : 9mm



Laboratory Information

Lab. Sample I.D. : ST50194/19-24
 Date Received : 17 February 2005
 Date Tested : 01 April 2005
 Test Method : BS 5669 : Part 1 : 1989, Clause 8

Test Results

Lab Sample ID	Thickness (mm)					Length (mm)			Width (mm)			Mass (kg)	Volume (m ³)	Density (kg/m ³)
	1	2	3	4	Avg	1	2	Avg	1	2	Avg			
ST50194/19	9.116	9.160	9.121	9.153	9.138	99.65	99.77	99.71	99.38	99.4	99.39	0.12	0.00009	1325
ST50194/20	9.086	9.179	9.277	9.266	9.202	99.68	99.76	99.72	99.47	99.39	99.43	0.12	0.00009	1315
ST50194/21	9.179	9.160	9.227	9.228	9.199	99.7	99.72	99.71	99.45	99.48	99.465	0.12	0.00009	1315
ST50194/22	8.833	8.944	9.034	9.057	8.967	99.71	99.78	99.75	99.61	99.56	99.585	0.12	0.00009	1347
ST50194/23	9.032	9.050	9.156	9.124	9.091	99.71	99.74	99.73	99.41	99.37	99.39	0.12	0.00009	1332
ST50194/24	9.017	9.064	9.043	9.102	9.057	99.78	99.75	99.77	99.65	99.73	99.69	0.12	0.00009	1332
												Average	1328	

Remark : The test results relate only to the samples tested.

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Report No. : 041823ST50194

Page 5 of 28

REPORT ON DETERMINATION OF MOISTURE CONTENT OF FIBRE CEMENT BOARD**Information Supplied by Client**

Client : Promat International (Asia Pacific) Limited
Project : Physical Test of Building Boards
Sample Description : Eterpan MD Fibre Cement Board
Size : 100 x 100mm
Nominal Thickness : 9mm



Laboratory Information

Lab. Sample I.D. : ST50194/19-24
Date Received : 17 February 2005
Date Test Started : 01 April 2005
Date Test Completed : 13 April 2005
Test Method : BS 5669 : Part 1 : 1989, Clause 9

Test Results

Lab. Sample I.D.	Mass of the Sample Before Drying (g)	Mass of the Sample After Drying to Constant Mass (g)	Moisture Content (%)
ST50194/19	118.31	112.75	4.93
ST50194/20	116.26	110.53	5.18
ST50194/21	116.88	111.27	5.04
ST50194/22	116.59	111.03	5.01
ST50194/23	116.66	111.41	4.71
ST50194/24	117.36	112.21	4.59
		Average	4.91

Remark : The test results relate only to the samples tested.

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Report No. : 041823ST50194

Page 6 of 28

REPORT ON DETERMINATION OF COMPRESSION STRENGTH OF FIBRE CEMENT BOARD

Information Supplied by Client

Client : Promat International (Asia Pacific) Limited
Project : Physical Test of Building Boards
Sample Description : Eterpan MD Fibre Cement Board
Size : 40 x 10 x 10mm
Nominal Thickness : 9mm



Laboratory Information

Lab. Sample I.D. : ST50194/25-30
Date Received : 17 February 2005
Date Tested : 29 March 2005
Test Method : BS 5669 : Part 1 : 1989, Clause 24

Test Results

Lab Sample I.D.	Width of Sample (mm)	Thickness of Sample (mm)	Cross Section Area (mm ²)	Maximum Applied Load (N)	Compressive Strength (N/mm ²)
ST50194/25	9.00	8.79	79.11	1518	19.19
ST50194/26	8.95	8.93	79.92	1763	22.06
ST50194/27	9.14	8.96	81.89	1582	19.32
ST50194/28	9.14	8.98	82.08	1875	22.84
ST50194/29	8.95	8.96	80.19	1633	20.36
ST50194/30	8.99	8.99	80.82	1863	23.05
			Average	1706	21.14

Remarks : 1.) The test results relate only to the samples tested.
2.) The test configuration and samples before test are shown in the photographs on page 17 of this report.

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Report No. : 041823ST50194

Page 7 of 28

REPORT ON DETERMINATION OF TENSILE STRENGTH OF FIBRE CEMENT BOARD**Information Supplied by Client**

Client : Promat International (Asia Pacific) Limited
Project : Physical Test of Building Boards
Sample Description : Eterpan MD Fibre Cement Board
Nominal Thickness : 9mm



Laboratory Information

Lab. Sample I.D. : ST50194/31-36
Date Received : 17 February 2005
Date Tested : 02 April 2005
Loading Rate : 1 mm/min
Test Method : BS 5669 : Part 1 : 1989, Clause 12

Test Results

Lab Sample I.D.	Width of Sample (mm)	Thickness of Sample (mm)	Section Area (mm ²)	Maximum Force (N)	Tensile Strength (N/mm ²)
ST50194/31	20.63	9.20	189.80	927	4.88
ST50194/32	20.80	9.33	194.06	928	4.78
ST50194/33	20.37	9.10	185.37	880	4.75
ST50194/34	20.57	9.08	186.78	970	5.19
ST50194/35	20.43	9.03	184.48	1082	5.87
ST50194/36	20.36	9.27	188.74	980	5.19
			Average	961	5.11

Remarks : 1.) The test results relate only to the samples tested.
2.) The test configuration and samples after test are shown in the photographs on pages 18 and 19 of this report.

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Report No. : 041823ST50194

Page 8 of 28

REPORT ON DETERMINATION OF BENDING STRENGTH AND MODULUS OF ELASTICITY OF FIBRE CEMENT BOARD PERPENDICULAR TO THE PLANE

Information Supplied by Client

Client : Promat International (Asia Pacific) Limited
Project : Physical Test of Building Boards
Sample Description : Eterpan MD Fibre Cement Board
Nominal Thickness : 9mm



Laboratory Information

Lab. Sample I.D. : ST50194/37-42
Date Received : 17 February 2005
Date Tested : 04 April 2005
Span of Support : 225mm
Loading Rate : 5mm/min
Test Method : BS 5669 : Part 1 : 1989, Clause 10 & 11

Test Results

Lab. Sample I.D.	Width of Sample (mm)	Thickness of Sample (mm)	Maximum Force (N)	Bending Strength (N/mm ²)	Modulus of Elasticity (N/mm ²)
ST50194/37	99.86	9.32	268.50	10.44	4550
ST50194/38	99.72	9.17	258.50	10.4	4254
ST50194/39	99.75	9.31	231.50	9.04	3893
ST50194/40	99.76	9.33	236.50	9.19	4941
ST50194/41	99.83	9.27	250.00	9.84	5172
ST50194/42	99.64	9.22	230.00	9.16	3665
			Average	9.68	4413

Remarks : 1.) The test results relate only to the samples tested.
2.) The force-extension graphs are shown on pages 11 to 16 of this report.
3.) The test configuration, samples before and after test are shown in the photographs on pages 20 and 21 of this report.

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Report No. : 041823ST50194

Page 9 of 28

REPORT ON DETERMINATION OF RESISTANCE TO IMPACT OF FIBRE CEMENT BOARD**Information Supplied by Client**

Client : Promat International (Asia Pacific) Limited
Project : Physical Test of Building Boards
Sample Description : Eterpan MD Fibre Cement Board
Size : 305 x 305 mm
Nominal Thickness : 9mm



Laboratory Information

Lab. Sample I.D. : ST50194/43-48
Date Received : 17 February 2005
Date Tested : 21 April 2005
Mass of Striker : 4.5 kg
Test Method : BS 5669 : Part 1 : 1989, Clause 21

Test Results

Lab Sample I D	Thickness (mm)					Maximum Drop Height (mm)	Impact Strength (mm/mm)	Failure Mode ¹
	1	2	3	4	Average			
ST50194/43	8.95	8.97	9.09	9.03	9.01	350	38.85	A
ST50194/44	9.14	9.21	9.16	9.13	9.16	350	38.21	A
ST50194/45	9.16	9.04	9.10	9.19	9.12	350	38.38	B
ST50194/46	8.98	9.04	9.08	9.09	9.05	325	35.91	C
ST50194/47	9.15	9.06	9.02	9.16	9.10	300	32.97	A
ST50194/48	9.01	8.97	8.89	8.87	8.94	300	33.56	B

Remarks : 1.) Failure modes are classified accordingly to BS 5669 : Part 1.
2.) The test results relate only to the samples tested.
3.) The samples after test are shown in the photographs on pages 22 to 24 of this report.

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Client Ref. : --
 Report No. : 041823ST50194

Page 10 of 28

REPORT ON DETERMINATION OF PANEL SHEAR STRENGTH OF FIBRE CEMENT BOARD**Information Supplied by Client**

Client : Promat International (Asia Pacific) Limited
 Project : Physical Test of Building Boards
 Sample Description : Eterpan MD Fibre Cement Board
 Nominal Thickness : 9mm



Laboratory Information

Lab. Sample I.D. : ST50194/49-54
 Date Received : 17 February 2005
 Date Test Started : 19 April 2005
 Date Test Completed : 20 April 2005
 Test Method : BS 5669 : Part 1 : 1989, Clause 13

Test Results

Lab Sample I.D	The Side Length of Sample (mm)	Thickness (mm)					Maximum Applied Load (N)	Panel Shear Strength (N/mm ²)
		1	2	3	4	Average		
ST50194/49	229	9.07	9.13	9.11	9.10	9.10	10771	3.65
ST50194/50	229	9.28	9.33	9.15	9.24	9.25	11320	3.78
ST50194/51	229	9.16	9.12	9.15	9.08	9.13	10409	3.52
ST50194/52	229	9.28	9.23	9.22	9.16	9.22	8476	2.84
ST50194/53	229	9.26	9.06	9.31	9.04	9.17	11728	3.95
ST50194/54	229	9.35	9.49	9.25	9.23	9.33	8958	2.96
Average							10277	3.45

Remarks : 1.) The test results relate only to the samples tested.
 2.) The test configuration and samples after test are shown in the photographs on pages 25 to 28 of this report.

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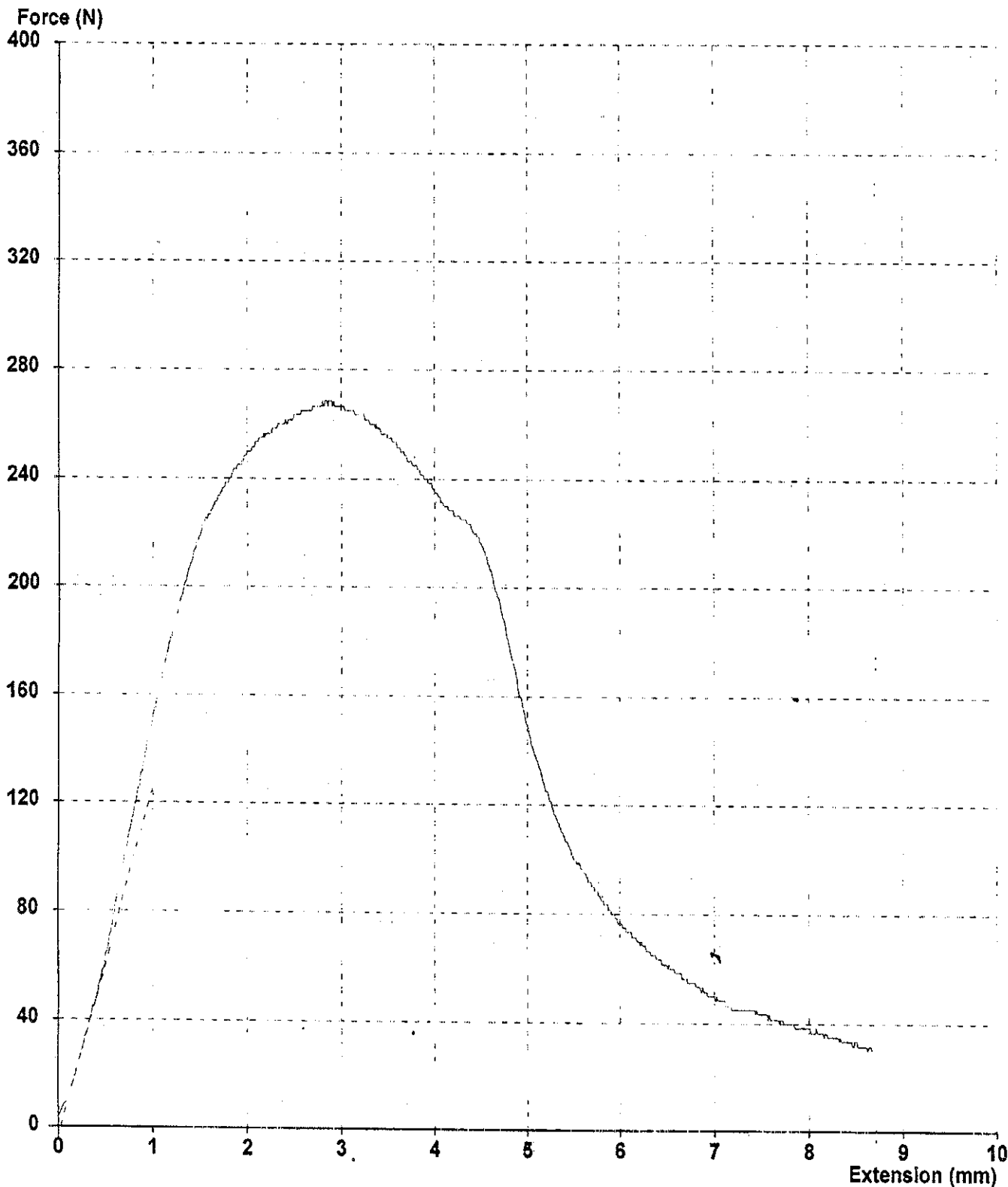
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Page 11 of 28

Lab. Sample I.D. : ST50194/37



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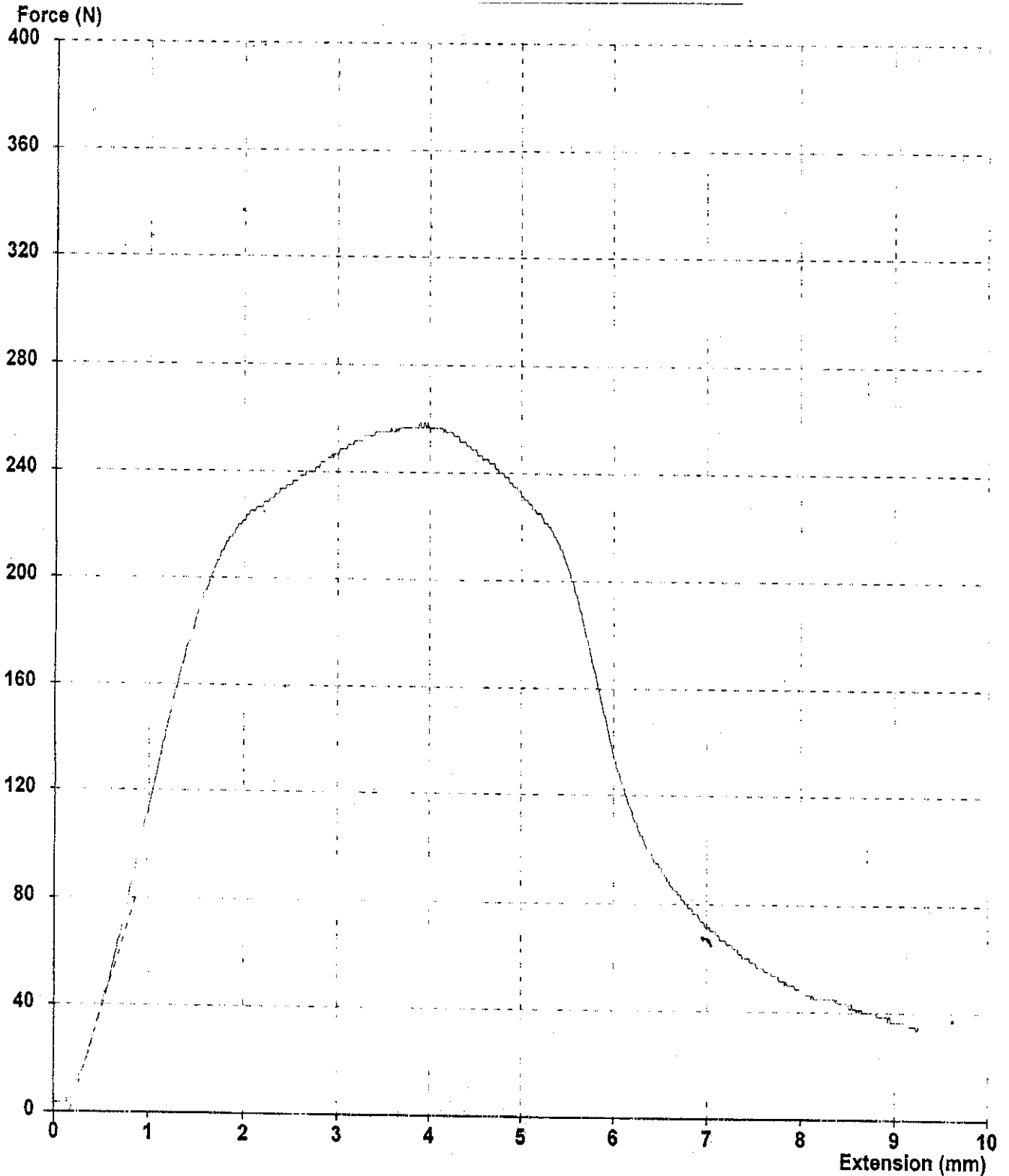
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Client Ref. : --
Report No. : 041823ST50194

Page 12 of 28

Lab. Sample I.D. : ST50194/38



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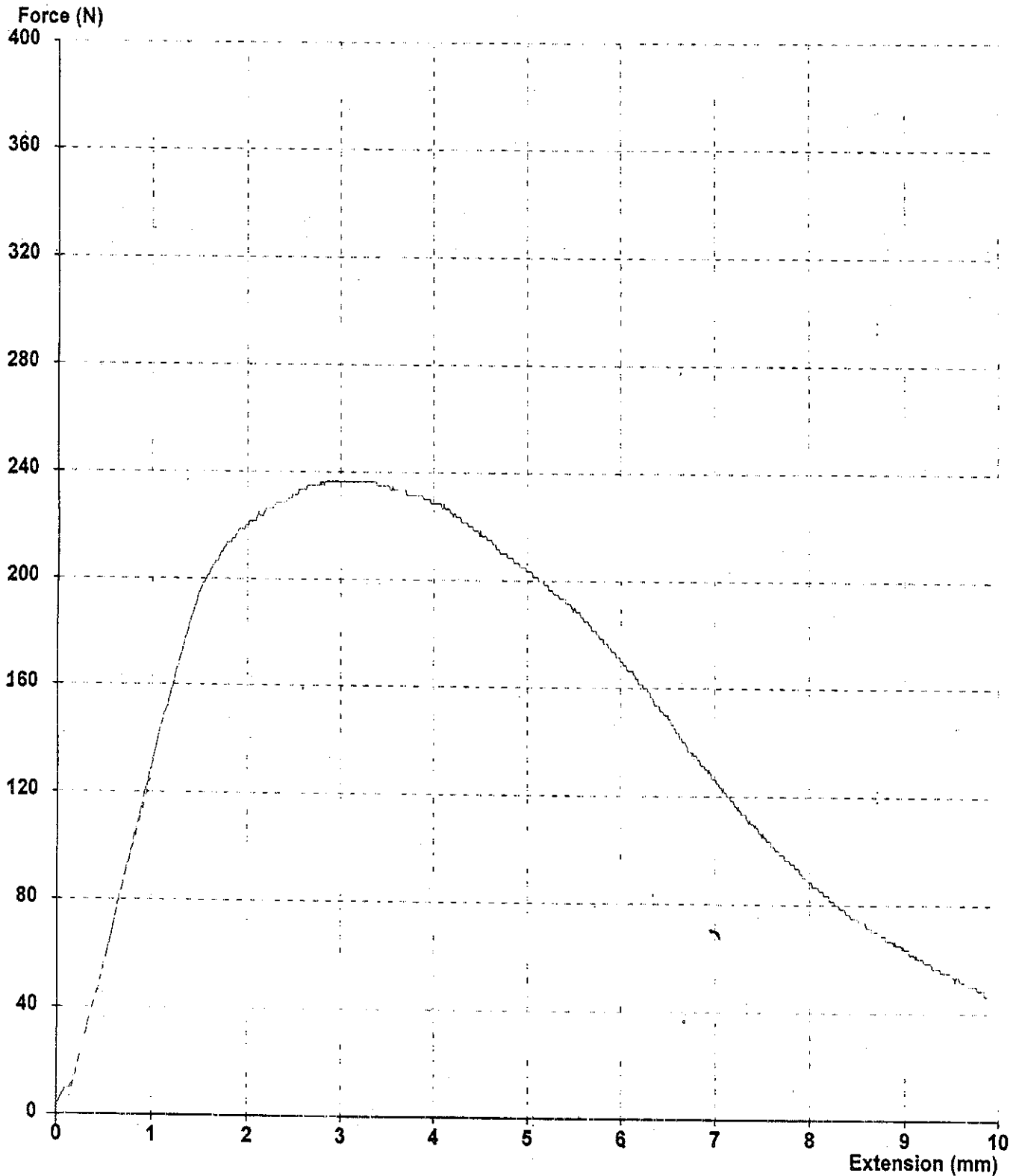
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Client Ref. : --
Report No. : 041823ST50194

Page 13 of 28

Lab. Sample I.D. : ST50194/39



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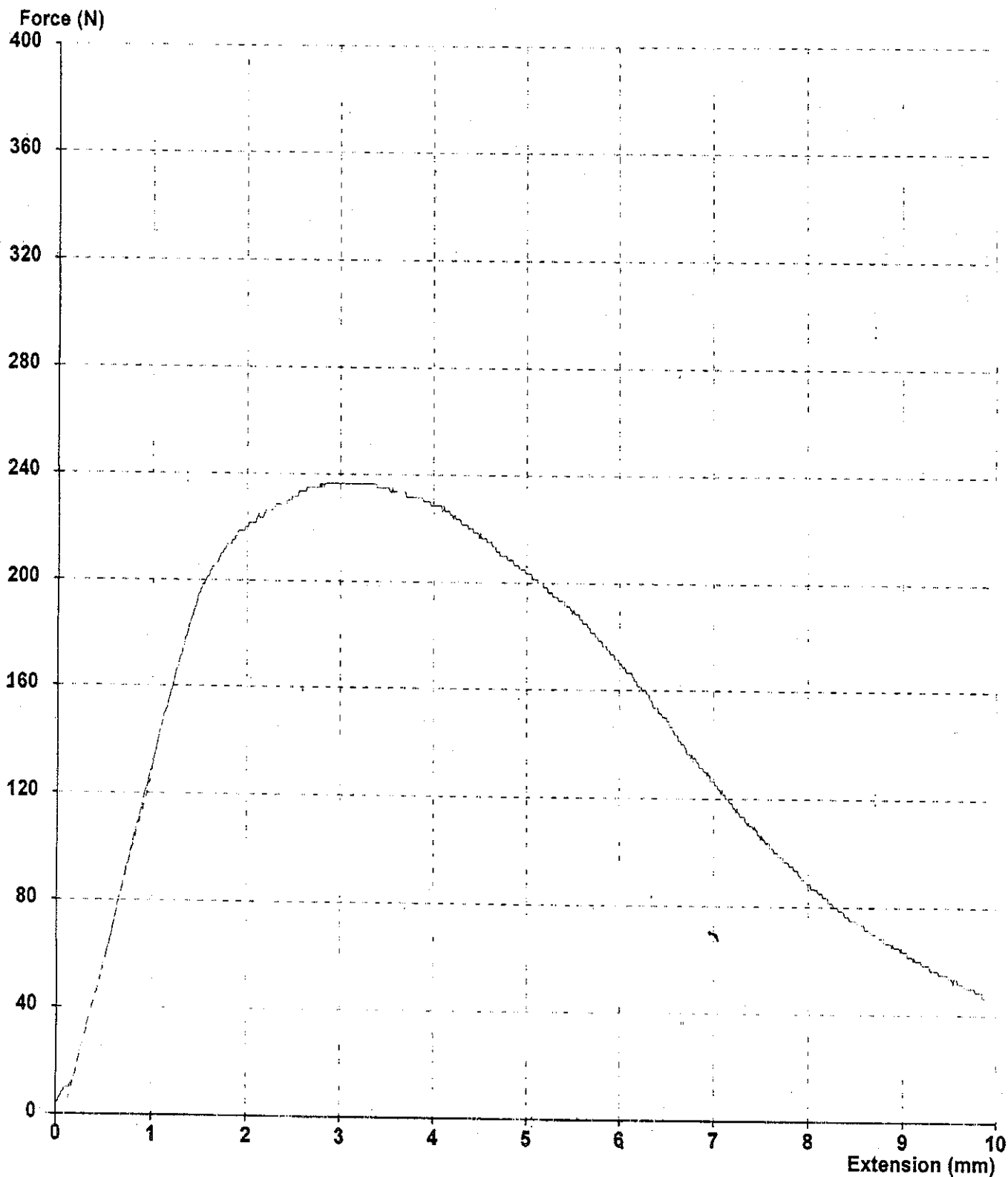
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MaterialLab

Client Ref. : --
Report No. : 041823ST50194

Page 14 of 28

Lab. Sample I.D. : ST50194/40



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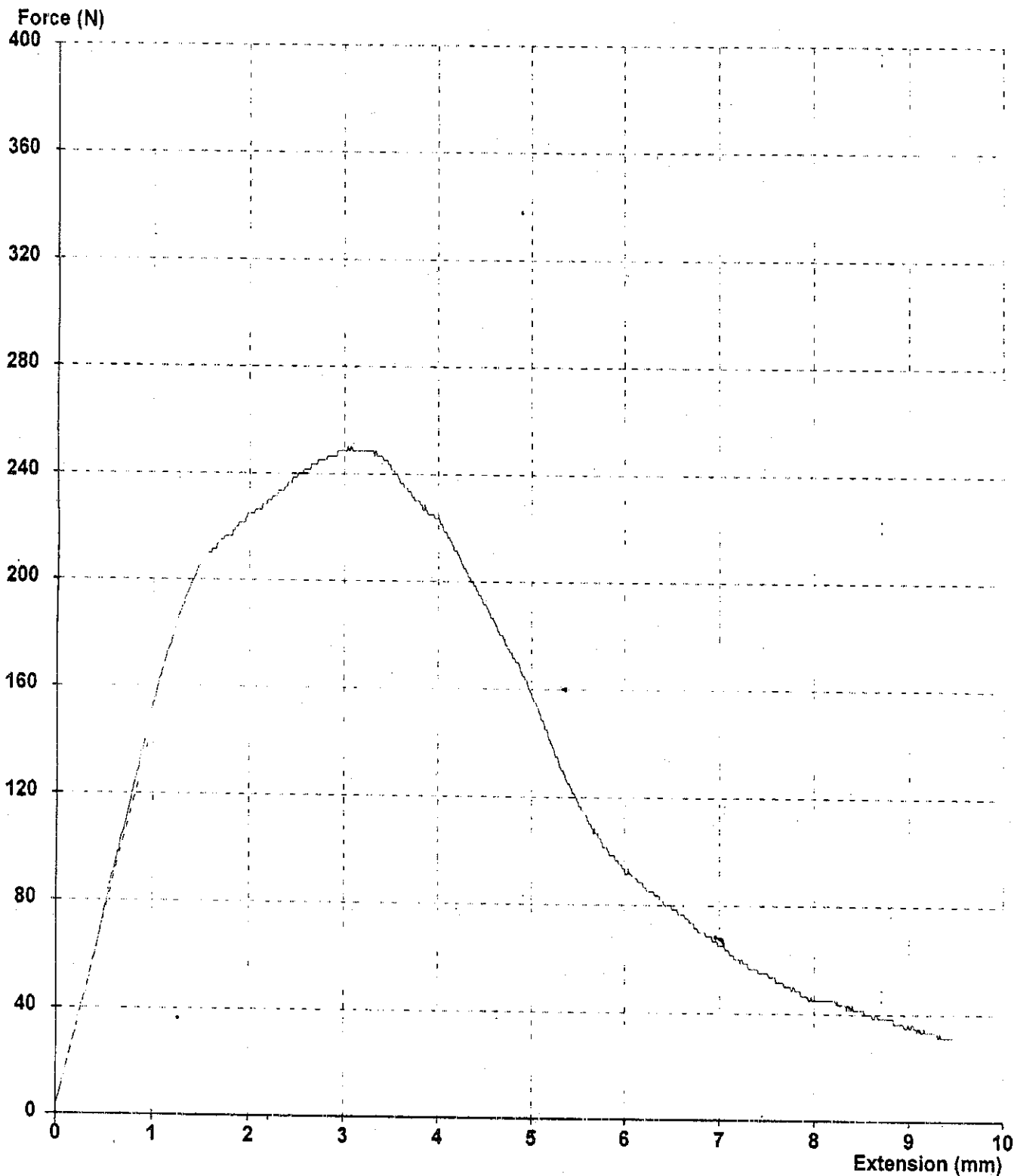
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Client Ref. : --
Report No. : 041823ST50194

Page 15 of 28

Lab. Sample I.D. : ST50194/41



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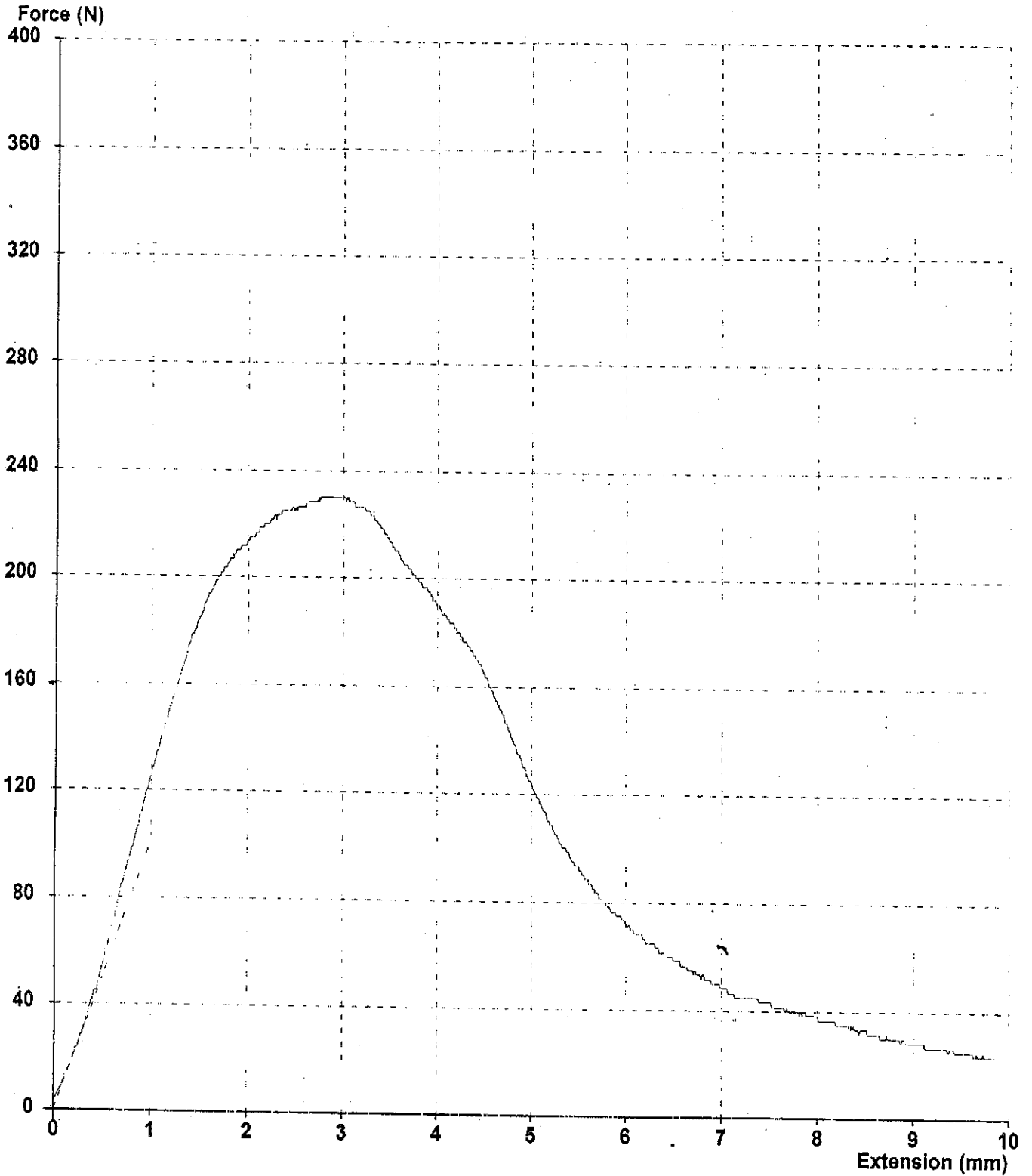
MaterialLab Division
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5 Lok Yi Street, 17 M S. Castle Peak Road,
Tai Lam, Tuen Mun, N T., Hong Kong

Tel : +852-2450 8233
Fax : +852-2450 6138
E-mail : matlab@fugro.com hk
Website : www.fugro.com



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Lab. Sample I.D. : ST50194/42



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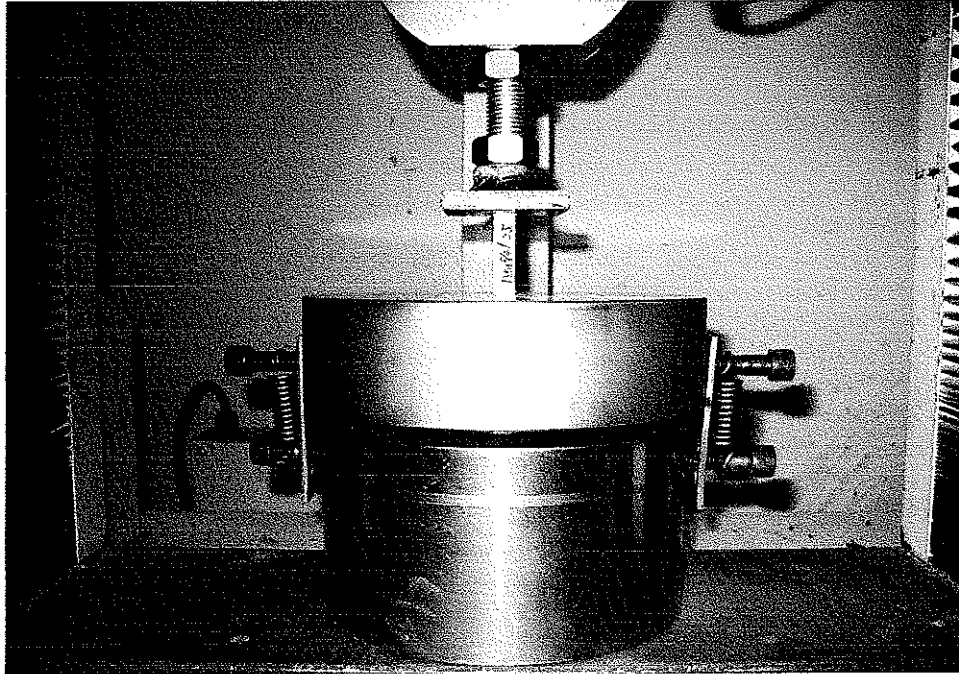
MateriaLab Division
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Page 17 of 28



Test Configuration
Sample I.D. : ST50194/25-30



Before Test
Sample I.D. : ST50194/25-30

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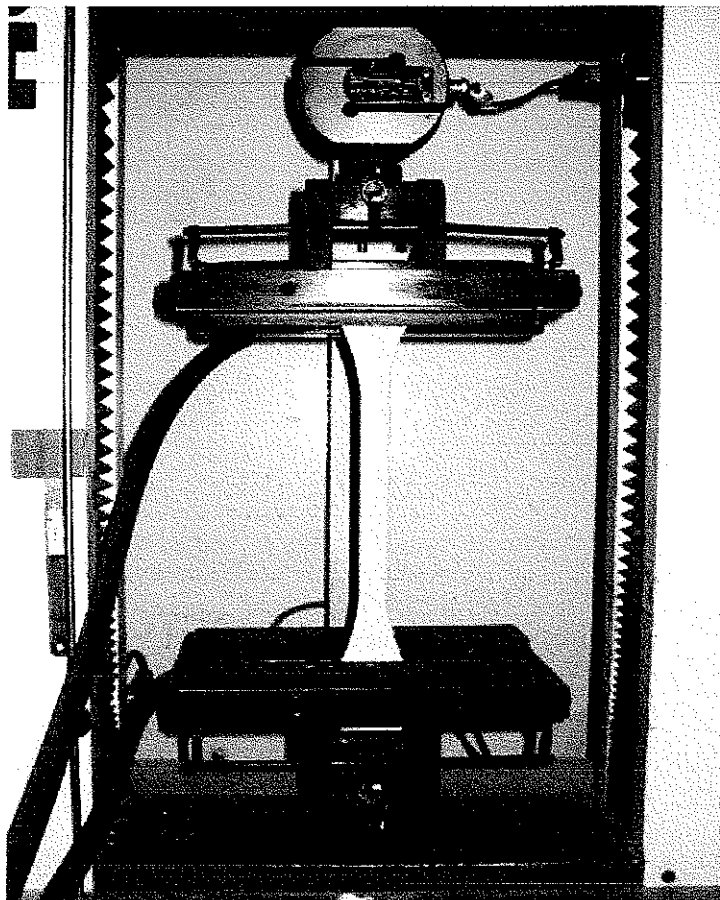
MaterialLab Division,
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5 Lok Yi Street, 17 M.S. Castle Peak Road,
Tai Lam Tuen Mun N.T., Hong Kong

Tel : +852-2450 8233
Fax : +852-2450 6138
E-mail : matlab@fugro.com.hk
Website : www.fugro.com

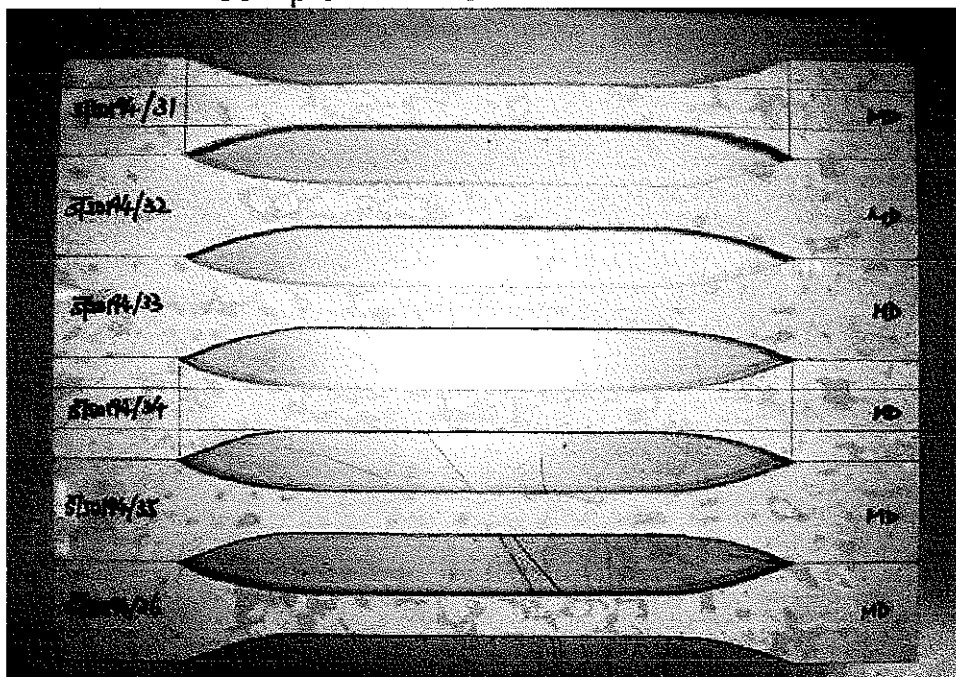
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Report No. : 041823ST50194

Page 18 of 28



Test Configuration
Sample I.D. : ST50194/31-36



Before Test
Sample I.D. : ST50194/31-36

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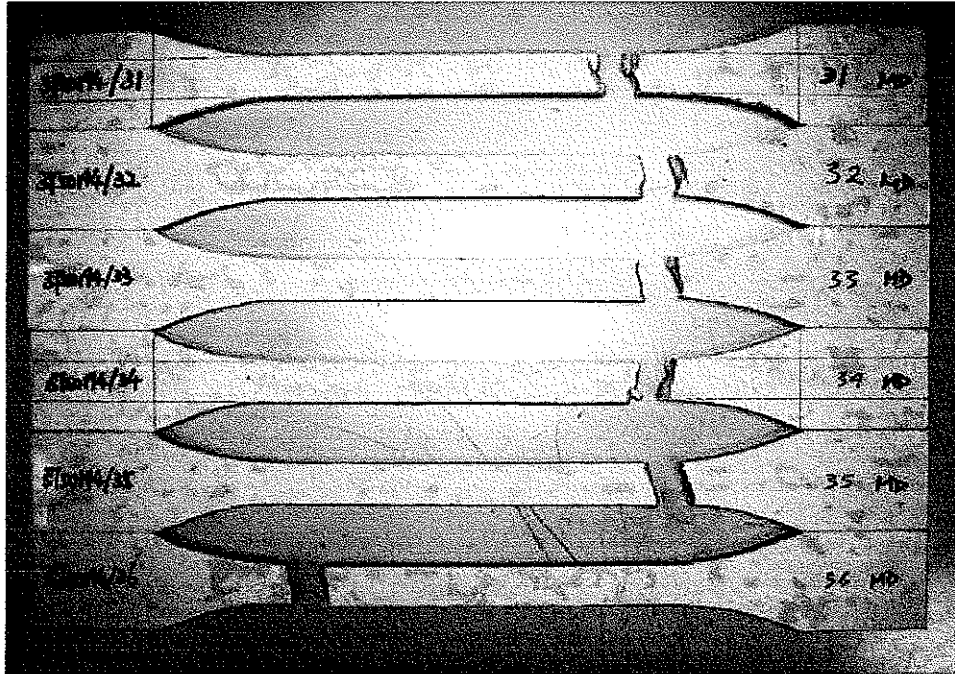
MaterialLab Division
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Page 19 of 28



After Test
Sample I.D. : ST50194/31-36

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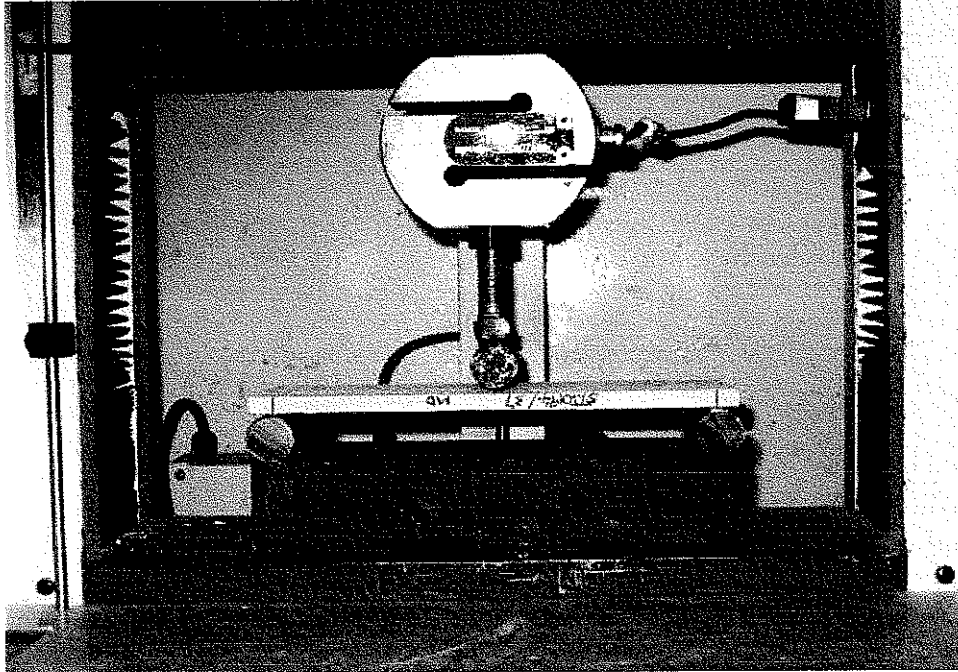
MateriaLab Division
Fugro Development Centre,
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Tai Lam, Tuen Mun, N T., Hong Kong

Tel : +852-2450 8233
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Website : www.fugro.com

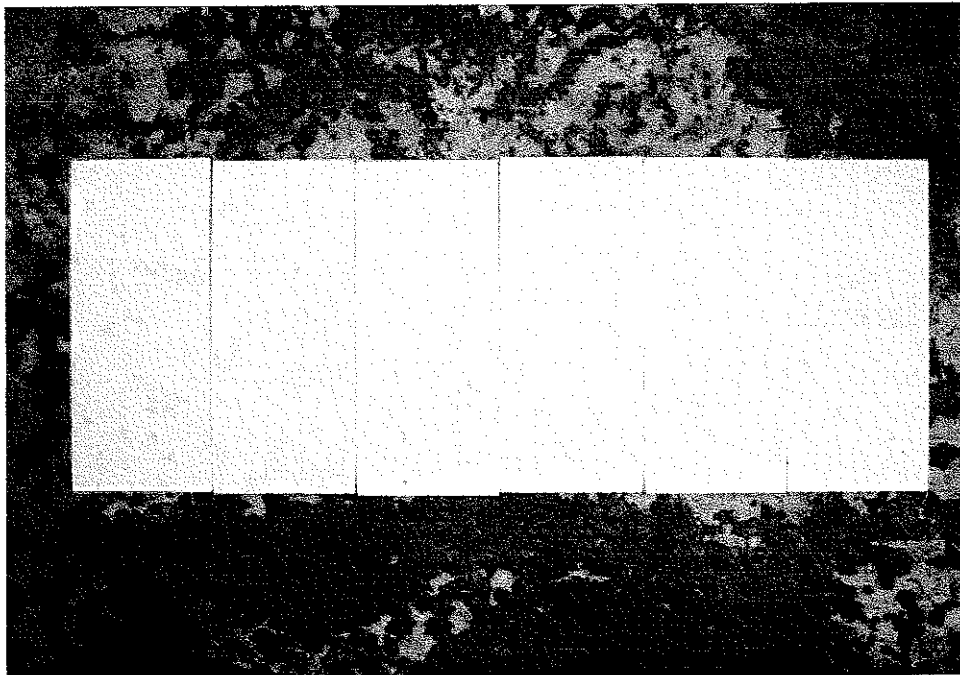
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Client Ref : --
Report No. : 041823ST50194

Page 20 of 28



Test Configuration
Sample I.D. : ST50194/37-42



Before Test
Sample I.D. : ST50194/37-42

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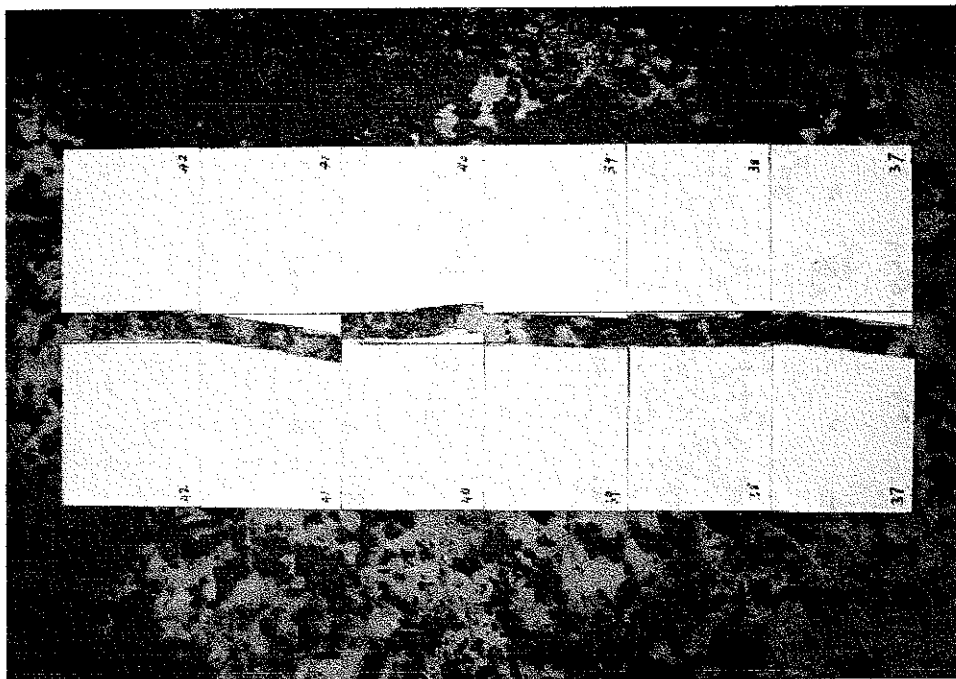
MateriaLab Division,
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Page 21 of 28



After Test
Sample I.D. : ST50194/37-42

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Website : www.fugro.com

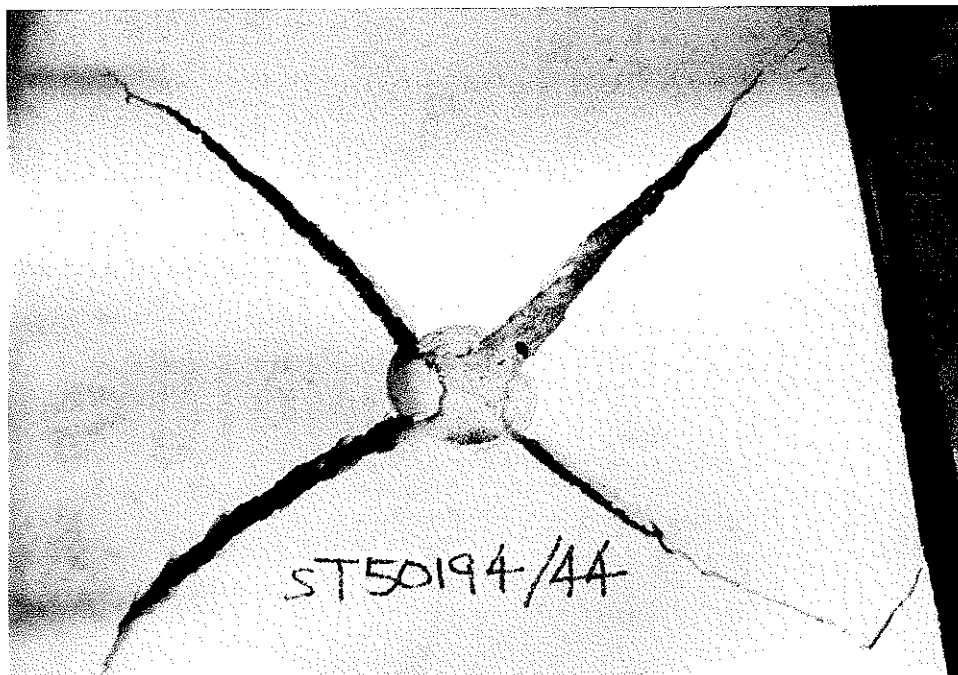
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Report No. : 041823ST50194

Page 22 of 28



After Test
Sample I.D. : ST50194/43



After Test
Sample I.D. : ST50194/44

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Website : www.fugro.com

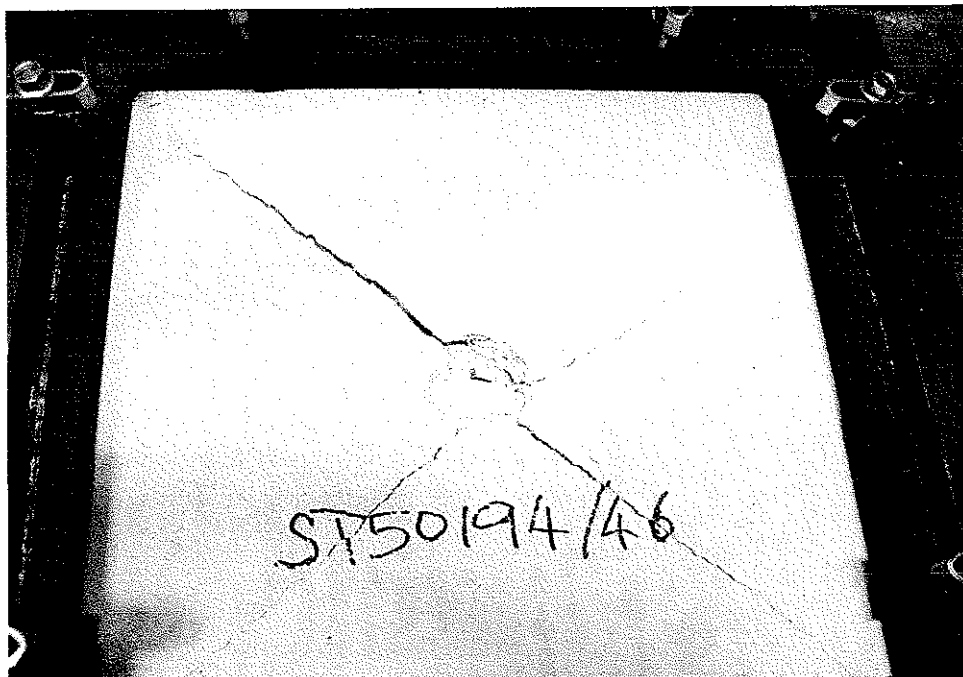
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Page 23 of 28



After Test
Sample I.D. : ST50194/45



After Test
Sample I.D. : ST50194/46

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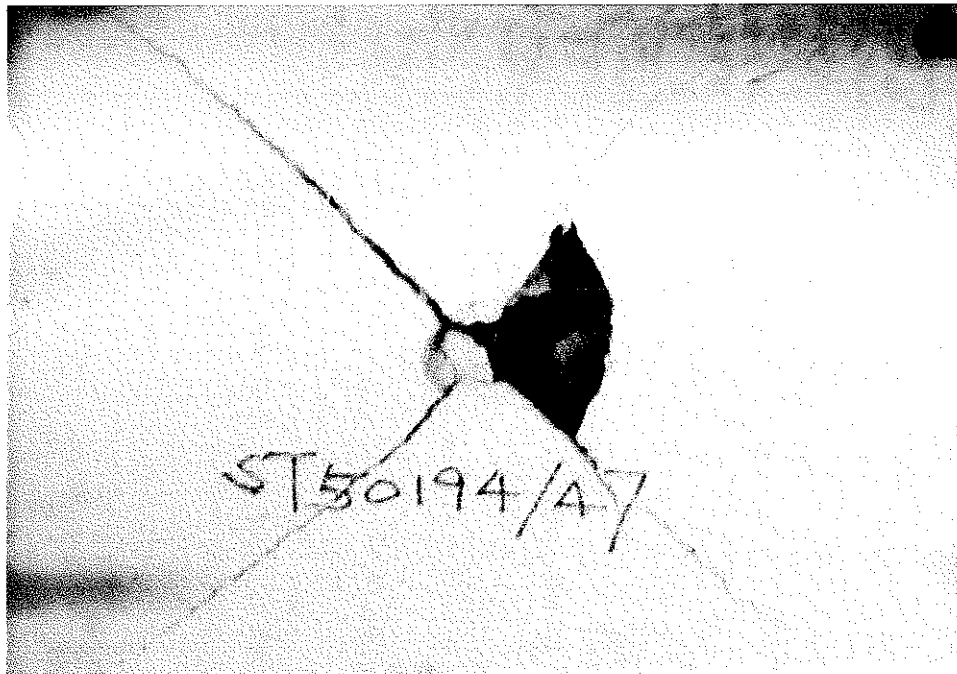
MaterialLab Division
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5 Lok Yi Street, 17 M.S. Castle Peak Road
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Page 24 of 28



After Test
Sample I.D. : ST50194/47



After Test
Sample I.D. : ST50194/48

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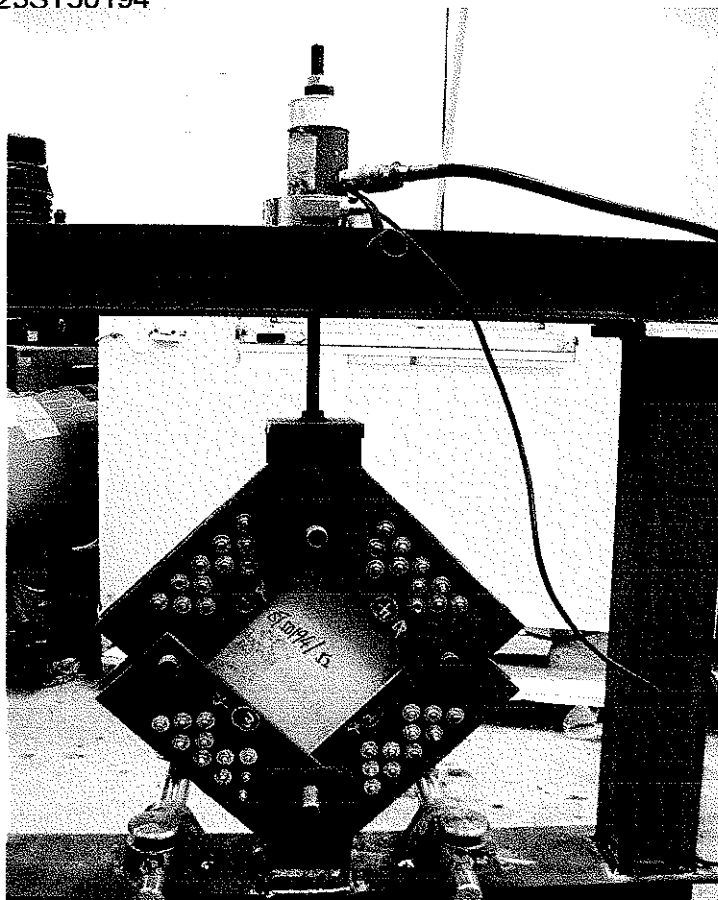
MaterialLab Division,
Fugro Development Centre,
5 Lok Yi Street, 17 M S. Castle Peak Road,
Tai Lam, Tuen Mun N T, Hong Kong

Tel : +852-2450 8233
Fax : +852-2450 6138
E-mail : matlab@fugro.com.hk
Website : www.fugro.com

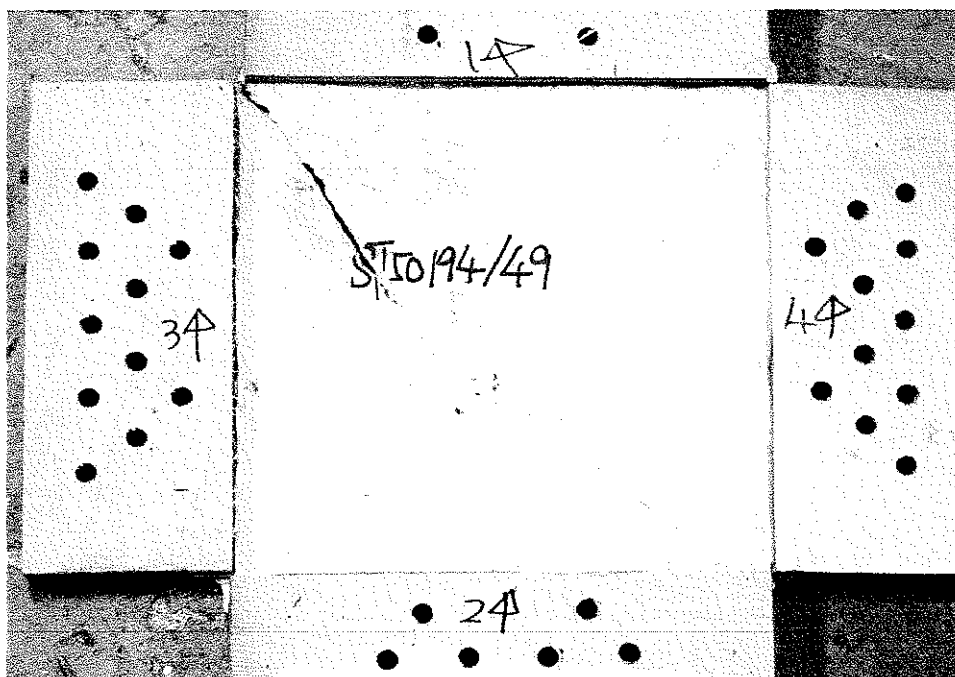
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Page 25 of 28



Test Configuration
Sample I.D. : ST50194/49-54



After Test
Sample I.D. : ST50194/49

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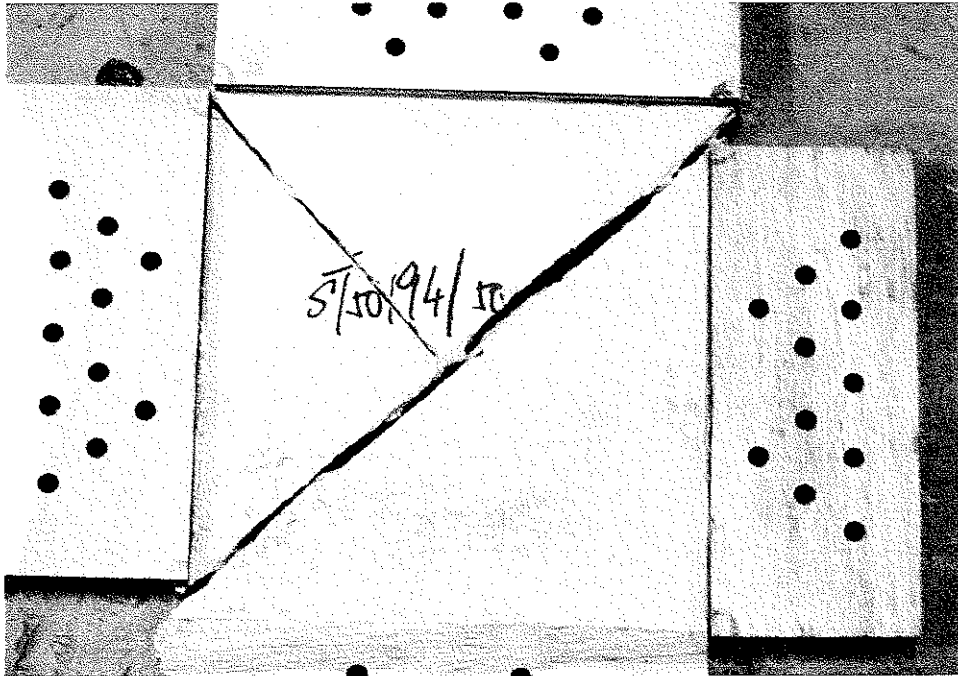
MateriaLab Division
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5 Lok Yi Street, 17 M S. Castle Peak Road
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Website : www.fugro.com

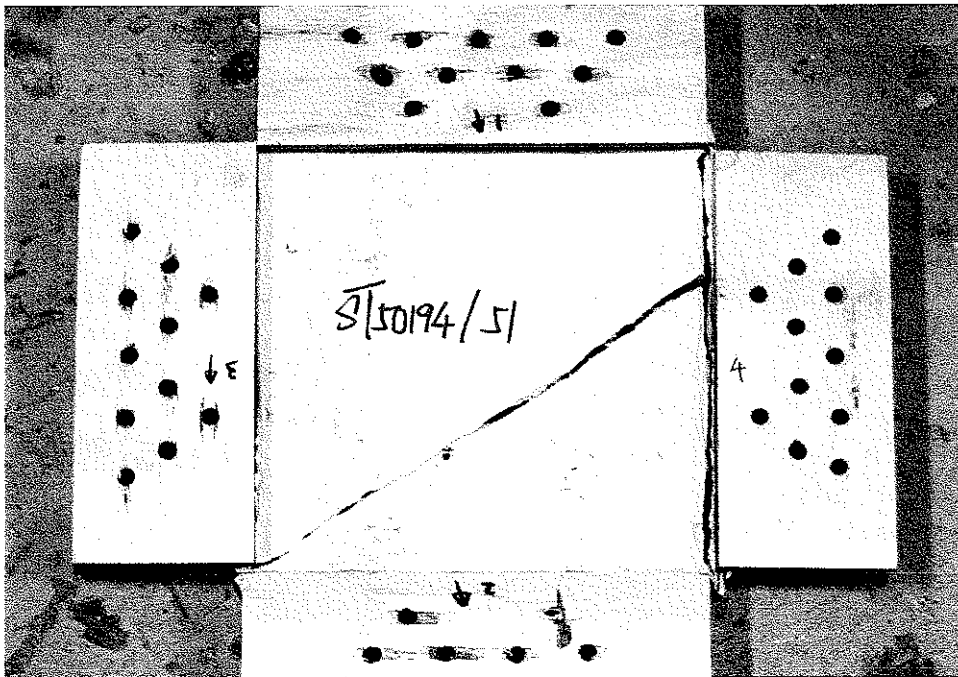
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Page 26 of 28



After Test
Sample I.D. : ST50194/50



After Test
Sample I.D. : ST50194/51

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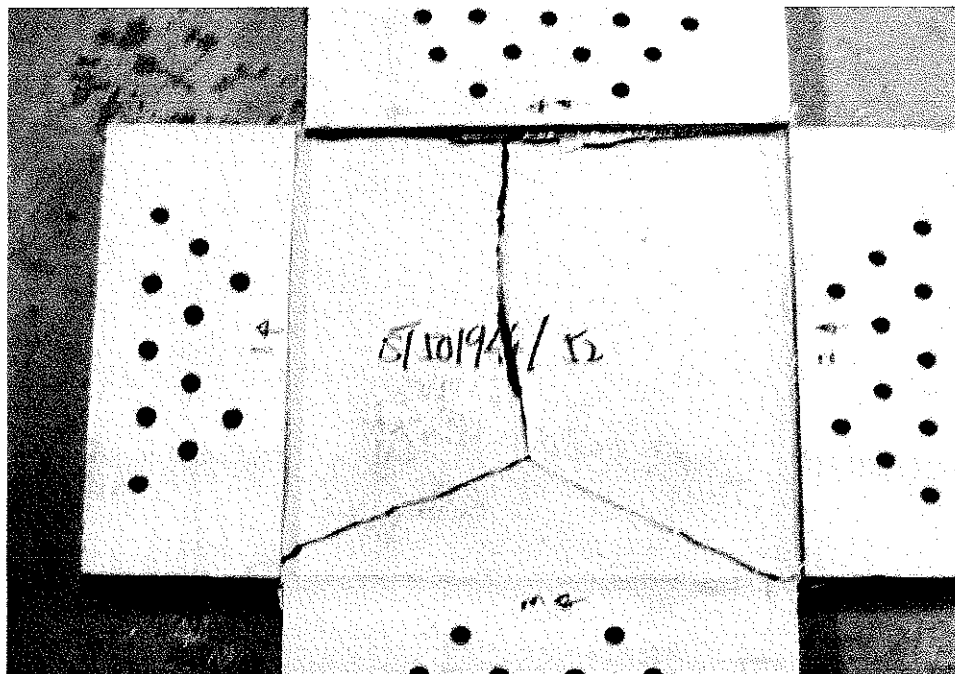
MateriaLab Division,
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Tel : +852-2450 8233
Fax : +852-2450 6138
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Website : www.fugro.com

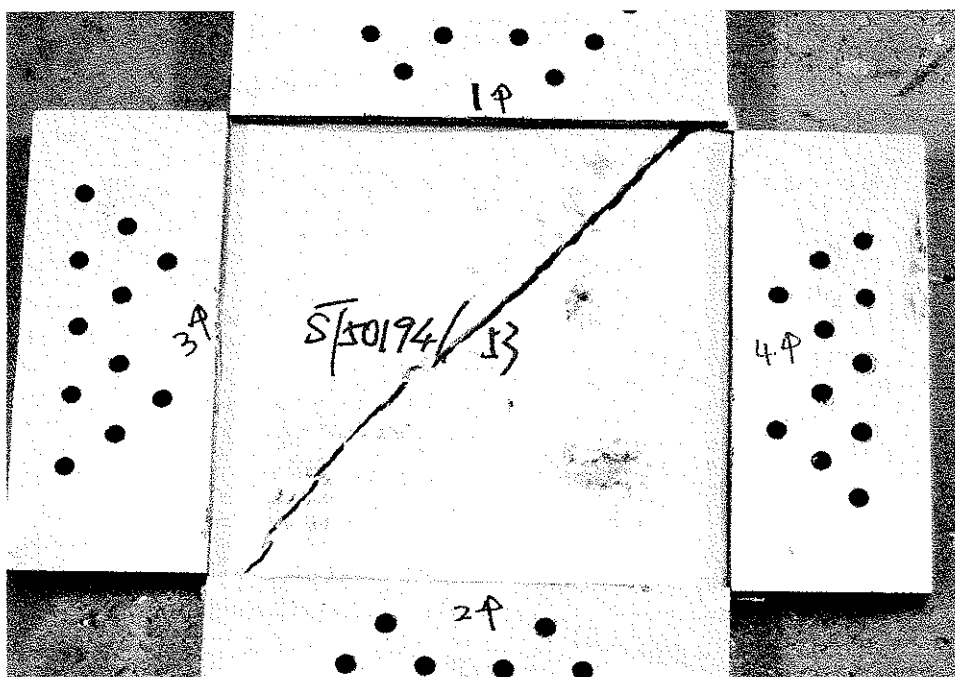
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Page 27 of 28



After Test
Sample I.D. : ST50194/52



After Test
Sample I.D. : ST50194/53

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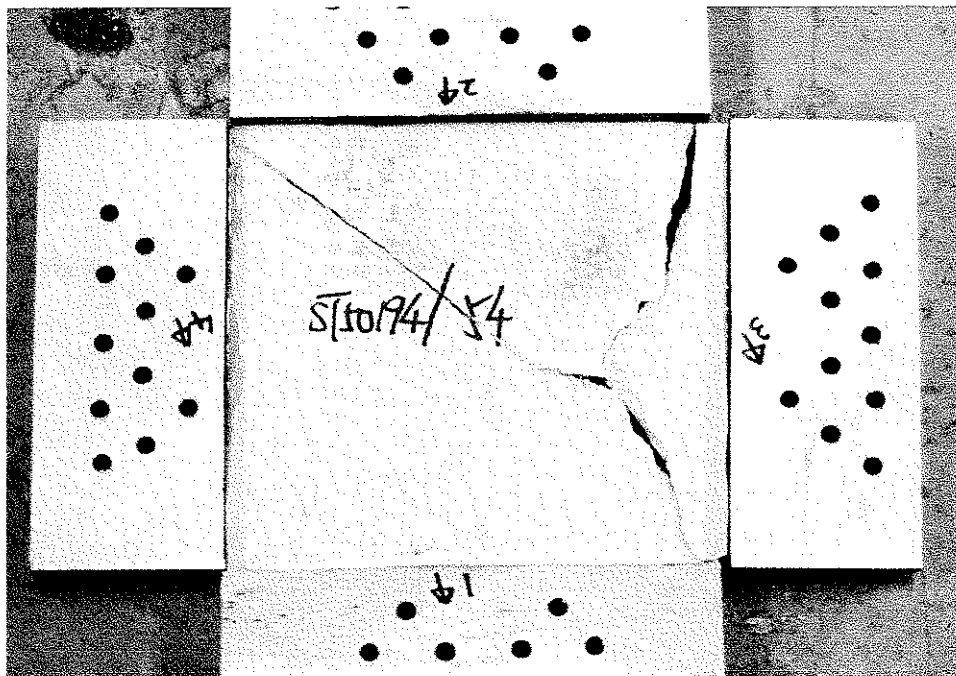
MateriaLab Division
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Page 28 of 28



After Test
Sample I.D. : ST50194/54