

Test Report No. 7191058019-MEC13/01B-ED
dated 25 Jul 2013



PSB Singapore

**Choose certainty.
Add value.**

Note: This report is issued subject to the Testing and Certification Regulations of the TÜV SÜD Group and the General Terms and Conditions of Business of TÜV SÜD PSB Pte Ltd. In addition, this report is governed by the terms set out within this report.

SUBJECT:

Testing of fibre cement boards submitted by Everest Industries Ltd

TESTED FOR:

Everest Industries Limited
The Genesis, A-32
Mohan Cooperative Industrial Estate
Mathura Road
New Delhi 110048
India

Attn: Mr Subrata Dutta

TEST METHODS:

1. Adopted ASTM C1185 : 2008 (2012) Standard Test Methods For Sampling And Testing Non-Asbestos Fiber-Cement Flat Sheet, Roofing And Siding Shingles, And Clapboards

Section 5 - Flexural Strength (Modulus of Rupture) Equilibrium Conditioning

Section 5 - Flexural Strength (Modulus of Rupture) Wet Conditioning

Section 6 - Density

Section 8 - Moisture Movement

Section 9 - Water Absorption

Section 10 - Moisture Content

Section 11 - Water Tightness



Laboratory:
TUV SUD PSB Pte. Ltd.
No.1 Science Park Drive
Singapore 118221

Phone : +65-6885 1333
Fax : +65-6776 8670
E-mail: testing@tuv-sud-psb.sg
www.tuv-sud-psb.sg
Co. Reg : 199002667R

Regional Head Office:
TUV SUD Asia Pacific Pte. Ltd.
3 Science Park Drive, #04-01/05
The Franklin, Singapore 118223
TUV®



2. Adopted ASTM D1037 : 2006a Standard Test Methods for Evaluating Properties of Wood-Base Fiber and Particle Panel Materials

Section 10 - Tension Parallel To Surface
Section 12 - Compression Parallel To Surface
Section 20 - Glue Line Shear (Block Type)
Section 21 - Falling Ball Impact

DESCRIPTION OF SAMPLE:

Fibre Cement board 'Everest Heavy Duty Board'

REMARKS:

1. The flexural strength (equilibrium and wet conditioning), tensile strength and density tests were conducted in the presence of Mr Sharad Malli from Everest Industries on 25 Jul 2013.
2. The density test samples were cut to 50 mm x 50 mm from 305 mm x 152 mm prior to test.
3. The average values of two directions for flexural strength, moisture movement, moisture content and tensile strength tests are reported as requested by the client.
4. The compressive strength test samples were prepared by the client : 4-ply, each 50 mm x 50 mm bonded with epoxy adhesive.
5. The glue line shear block test samples were prepared by TUV SUD PSB Pte Ltd as follows :
 - a. 2-ply, each 45 mm x 50 mm were bonded with epoxy adhesive as one set.
 - b. Two sets were bonded to form a shear force test piece with 6 mm overhang.

Handwritten signature of Eddie Suwand in black ink.

Eddie Suwand
Senior Associate Engineer

Handwritten signature of Eng Aik How in black ink.

Eng Aik How
Engineer
Building
Mechanical Centre

Test Report No. 7191058019-MEC13/01B-ED
dated 25 Jul 2013



PSB Singapore

TEST RESULTS:

'Everest Heavy Duty Board', size : 305 mm x 152 mm

Section 5 - Flexural Strength (Modulus of Rupture) Equilibrium Conditioning

Direction : Grain

Crosshead speed : 50 mm/min

Sample Reference	1	2	3	4	5
Maximum Load (N)	536.31	538.08	515.72	502.65	522.31
Length of Span (mm)	254				
Width of Specimen (mm)	152	152	152	152	152
Thickness (mm)	9.32	9.09	9.15	9.18	9.26
Flexural Strength (MPa)	15.48	16.32	15.44	14.95	15.27
Average Flexural Strength (MPa)	15.49				

Direction : Across Grain

Crosshead speed : 50 mm/min

Sample Reference	1	2	3	4	5
Maximum Load (N)	1060.30	1132.27	1115.65	1180.70	1076.51
Length of Span (mm)	254				
Width of Specimen (mm)	152	152	152	152	152
Thickness (mm)	9.26	9.20	9.34	9.28	9.25
Flexural Strength (MPa)	30.99	33.53	32.06	34.37	31.54
Average Flexural Strength (MPa)	32.50				

Average Flexural Strength, two directions (MPa)	24.00
---	-------

Test Report No. 7191058019-MEC13/01B-ED
dated 25 Jul 2013



PSB Singapore

TEST RESULTS:

'Everest Heavy Duty Board', size 305 mm x 152 mm

Section 5 - Flexural Strength (Modulus of Rupture) Wet Conditioning

Direction : Grain

Crosshead speed : 50 mm/min

Sample Reference	1	2	3	4	5
Maximum Load (N)	383.61	351.38	386.39	419.89	392.83
Length of Span (mm)	254				
Width of Specimen (mm)	152	152	152	152	152
Thickness (mm)	9.23	9.12	9.17	9.12	9.24
Flexural Strength (MPa)	11.29	10.59	11.52	12.65	11.53
Average Flexural Strength (MPa)	11.52				

Direction : Across Grain

Crosshead speed : 50 mm/min

Sample Reference	1	2	3	4	5
Maximum Load (N)	698.12	638.22	646.83	665.14	706.23
Length of Span (mm)	254				
Width of Specimen (mm)	152	152	152	152	152
Thickness (mm)	9.35	9.32	9.21	9.16	9.16
Flexural Strength (MPa)	20.02	18.42	19.11	19.87	21.10
Average Flexural Strength (MPa)	19.70				

Average Flexural Strength, two directions (MPa)	15.61
---	-------

Ed
[Signature]

Test Report No. 7191058019-MEC13/01B-ED
dated 25 Jul 2013



PSB Singapore

TEST RESULTS:

'Everest Heavy Duty Board', size 50 mm x 50 mm

Section 6 - Density

Sample Reference	1	2	3	4	5	6
Dry Mass (kg)	0.03340	0.03467	0.03496	0.03529	0.03536	0.03352
Saturated weight (kg)	0.04131	0.04261	0.04296	0.04334	0.04348	0.04115
Suspended weight (kg)	0.01868	0.01919	0.01934	0.01943	0.01968	0.01861
Volume (m ³)	0.02263	0.02342	0.02362	0.02391	0.02380	0.02254
Density (kg/m ³)	1475.92	1480.36	1480.10	1475.95	1485.71	1487.13
Average Density (kg/m ³)	1480.86					

TUV
SUD

Ed

Test Report No. 7191058019-MEC13/01B-ED
dated 25 Jul 2013



PSB Singapore

TEST RESULTS:

'Everest Heavy Duty Board', size 305 mm x 76 mm

Section 7 - Moisture Movement

Test Temperature : 23°C

Direction : Grain

Sample Reference	1	2	3
Length at 30% RH (mm)	304.30	304.20	304.29
Length at 90% RH (mm)	304.31	304.22	304.31
Length Change (%)	0.0033	0.0066	0.0066
Average Length Change (%)	0.006		

Direction : Across Grain

Sample Reference	1	2	3
Length at 30% RH (mm)	304.91	304.61	304.86
Length at 90% RH (mm)	304.92	304.64	304.89
Length Change (%)	0.0033	0.0098	0.0098
Average Length Change (%)	0.008		

Average Moisture Movement, two directions (%)	0.007
---	-------

Ed E

Test Report No. 7191058019-MEC13/01B-ED
dated 25 Jul 2013



PSB Singapore

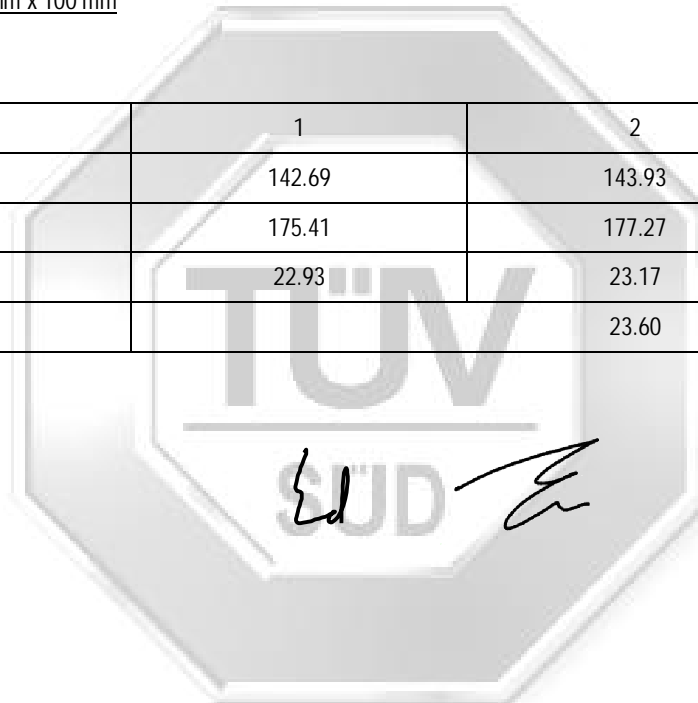
TEST RESULTS:

'Everest Heavy Duty Board', size 100 mm x 100 mm

Section 9 - Water Absorption

Test condition : 23°C for 48 hrs

Sample Reference	1	2	3
Weight before immersion (g)	142.69	143.93	140.87
Weight after immersion (g)	175.41	177.27	175.64
Water Absorption (%)	22.93	23.17	24.67
Average Water Absorption (%)	23.60		



Test Report No. 7191058019-MEC13/01B-ED
dated 25 Jul 2013



PSB Singapore

TEST RESULTS:

'Everest Heavy Duty Board', size 305 mm x 152 mm

Section 10 - Moisture Content

Test condition : 90°C till constant mass

Direction : Grain

Sample Reference	1	2	3
Initial Mass (g)	536.39	543.32	521.48
Final Mass (g)	519.41	526.13	504.63
Moisture Content (%)	3.27	3.27	3.34
Average Moisture Content (%)	3.29		

Direction : Across Grain

Sample Reference	1	2	3
Initial Mass (g)	688.23	699.52	672.90
Final Mass (g)	664.18	673.35	656.47
Moisture Content (%)	3.62	3.89	2.50
Average Moisture Content (%)	3.34		

Average Moisture Content, two directions (%)	3.32
--	------

Ed *E*

Test Report No. 7191058019-MEC13/01B-ED
dated 25 Jul 2013



PSB Singapore

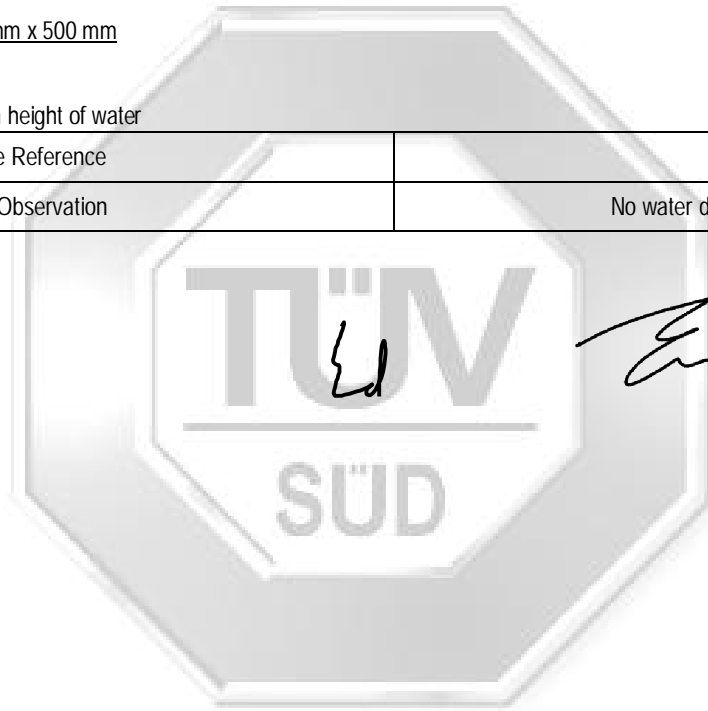
TEST RESULT:

'Everest Heavy Duty Board', size 500 mm x 500 mm

Section 11 - Water Tightness

Test condition : 23°C for 24 hrs, 50 mm height of water

Sample Reference	1
Visual Observation	No water droplets at the underside



Test Report No. 7191058019-MEC13/01B-ED
dated 25 Jul 2013



PSB Singapore

TEST RESULTS:

'Everest Heavy Duty Board', Tensile test piece

Section 10 - Tension Parallel To Surface

Direction : Grain

Crosshead speed : 4 mm/min

Grip length : 115 mm

Sample Reference	1	2	3
Maximum Load (N)	4231.54	4052.34	4097.31
Width of Specimen (mm)	38	38	38
Thickness (mm)	9.19	9.17	9.13
Tensile Strength (MPa)	12.12	11.63	11.81
Average Tensile Strength (MPa)	11.85		

Direction : Across Grain

Crosshead speed : 4 mm/min

Grip length : 115 mm

Sample Reference	1	2	3
Maximum Load (N)	1885.46	1722.04	2135.00
Width of Specimen (mm)	38	38	38
Thickness (mm)	9.14	9.14	9.11
Tensile Strength (MPa)	5.43	5.00	6.17
Average Tensile Strength (MPa)	5.52		

Average Tensile Strength, two directions (MPa)	8.69
--	------

Test Report No. 7191058019-MEC13/01B-ED
dated 25 Jul 2013



PSB Singapore

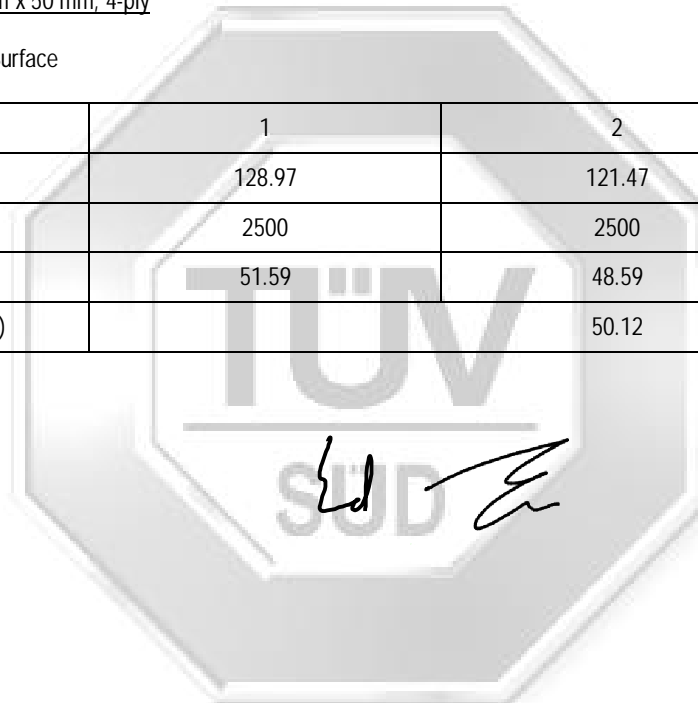
TEST RESULTS:

'Everest Heavy Duty Board', size 50 mm x 50 mm, 4-ply

Section 12 - Compression Parallel To Surface

Test speed : 0.5 N/mm².s

Sample Reference	1	2	3
Maximum Load (N)	128.97	121.47	125.43
Test area (mm ²)	2500	2500	2500
Compressive Strength (MPa)	51.59	48.59	50.17
Average Compressive Strength (MPa)	50.12		



Test Report No. 7191058019-MEC13/01B-ED
dated 25 Jul 2013



PSB Singapore

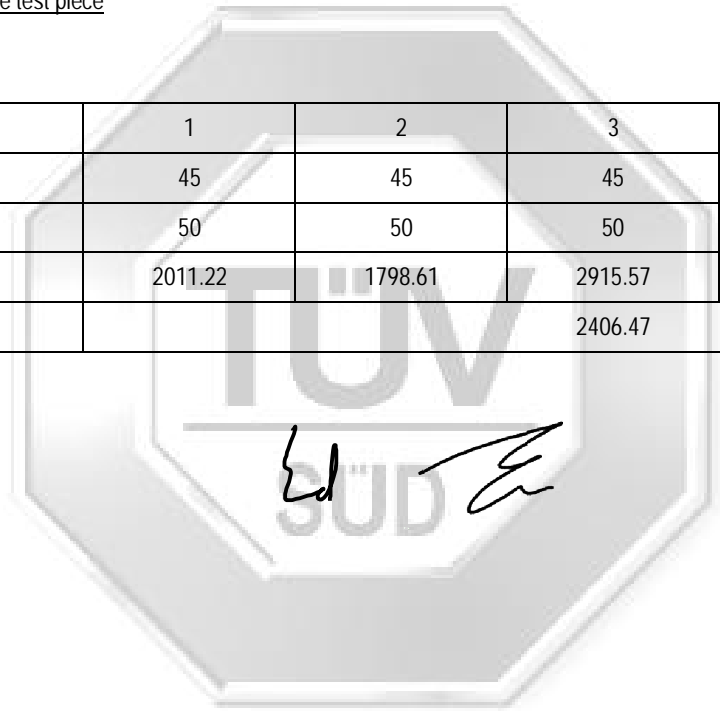
TEST RESULTS:

'Everest Heavy Duty Board', Shear force test piece

Section 20 - Glue Line Shear Block

Test speed : 0.6 mm/min

Sample Reference	1	2	3	4	5
Length of Specimen (mm)	45	45	45	45	45
Width of Specimen (mm)	50	50	50	50	50
Shear Force (N)	2011.22	1798.61	2915.57	2022.69	3284.27
Average Shear Force (N)	2406.47				



Test Report No. 7191058019-MEC13/01B-ED
dated 25 Jul 2013



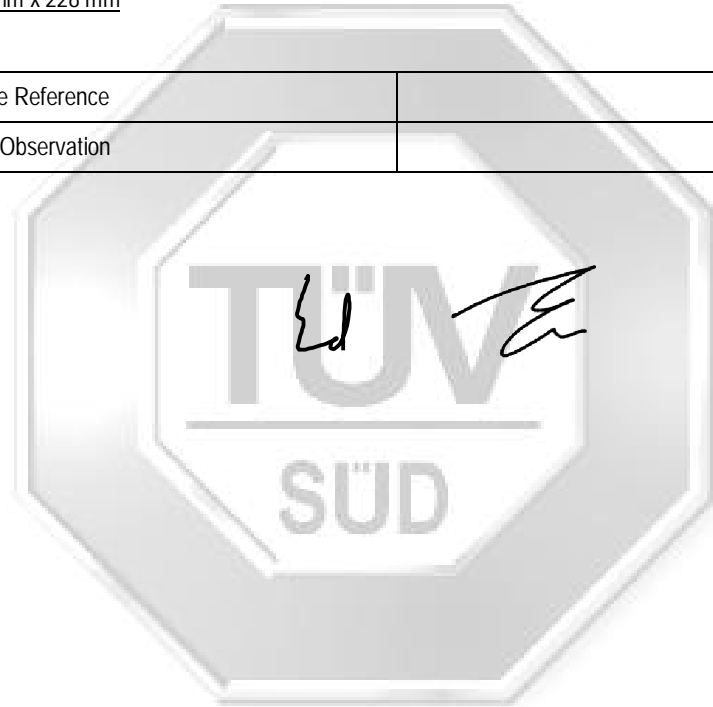
PSB Singapore

TEST RESULT:

'Everest Heavy Duty Board', size 254 mm x 228 mm

Section 21 - Falling Ball Impact

Sample Reference	1
Visual Observation	3.0 m





Please note that this Report is issued under the following terms :

1. This report applies to the sample of the specific product/equipment given at the time of its testing/calibration. The results are not used to indicate or imply that they are applicable to other similar items. In addition, such results must not be used to indicate or imply that TÜV SÜD PSB approves, recommends or endorses the manufacturer, supplier or user of such product/equipment, or that TÜV SÜD PSB in any way "guarantees" the later performance of the product/equipment. Unless otherwise stated in this report, no tests were conducted to determine long term effects of using the specific product/equipment.
2. The sample/s mentioned in this report is/are submitted/supplied/manufactured by the Client. TÜV SÜD PSB therefore assumes no responsibility for the accuracy of information on the brand name, model number, origin of manufacture, consignment or any information supplied.
3. Nothing in this report shall be interpreted to mean that TÜV SÜD PSB has verified or ascertained any endorsement or marks from any other testing authority or bodies that may be found on that sample.
4. This report shall not be reproduced wholly or in parts and no reference shall be made by the Client to TÜV SÜD PSB or to the report or results furnished by TÜV SÜD PSB in any advertisements or sales promotion.
5. Unless otherwise stated, the tests were carried out in TÜV SÜD PSB Pte Ltd, No.1 Science Park Drive Singapore 118221.

July 2011

