

# LIGHTHERM®

Superlight aggregates for the preparation of  
lightweight insulation screed



A Singapore Product



PSB Singapore  
Certified

**VODAPRUF**

# KEY FEATURES

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## Ultra Lightweight, $\rho = 250\text{kg/m}^3$

Reduce structural weight and optimize design



## High Thermal Insulation, $\lambda = 0.067\text{W/mK}$

Energy efficient and cost saving



## Acoustic Insulation, 14dB reduction\*

\*with 50mm thickness application, 14dB impact sound reduction at 500Hz

Increase comfort level



PSB Singapore  
Certified

- Lightherm has acquired COC (Certificate of Conformity) issued by TÜV SÜD-PSB Singapore
- Listed in Singapore PSB Product Listing Scheme

EN 13501-1  
Fire Classification  
A2-S1-D0

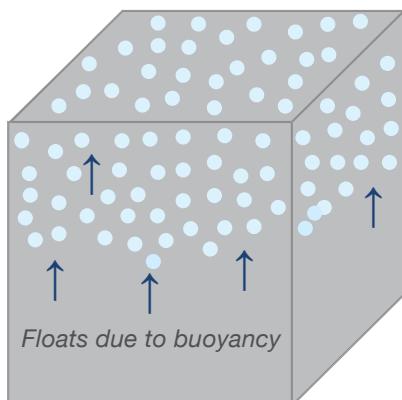
# PRODUCTS DETAILS

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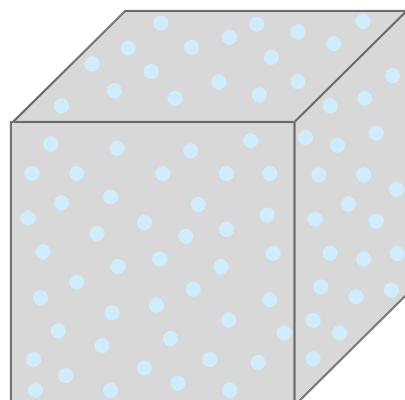
**Lightherm** is a lightweight aggregate specially treated with our patented VOD additives. Lightherm when mixed with cement, becomes a lightweight screed (Lightherm Screed) - density of only 250kg/m<sup>3</sup>. It achieved thermal conductivity - as low as 0.067 W/mk. Lightherm Screed has acquired COC (Certificate of Conformity) issued by TÜV SÜD PSB Singapore. Lightherm Screed is suitable for indoor and outdoor applications.



**Normal lightweight aggregates**



**Lightherm aggregates**



- ✓ No Floating
- ✓ Guarantee Blends Well
- ✓ No Additive Required

## LIGHTERM ®

## LIGHTERM ® MINI



- granulometry **3-6mm**;

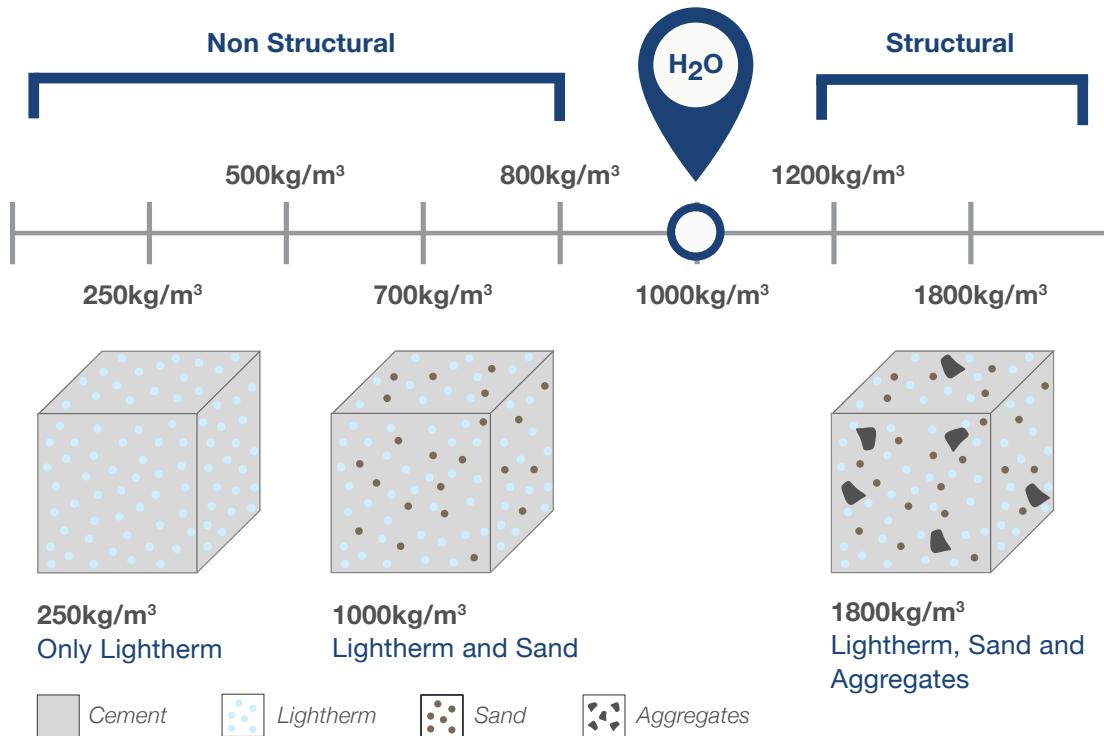


- granulometry **2mm**;

Refer to page 22 for mixing procedure

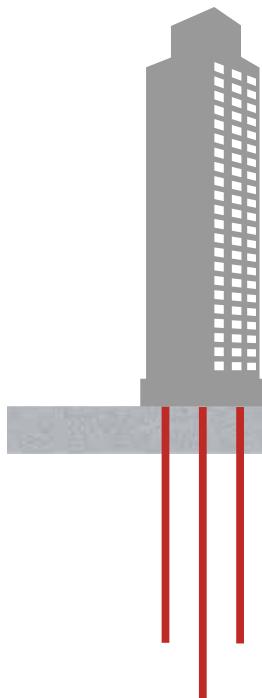
## SOME EXAMPLES OF DIFFERENT LIGHTERM MIXTURE

As LIGHTERM blends well with no segregation, concrete/screed with all kinds of density can be made!

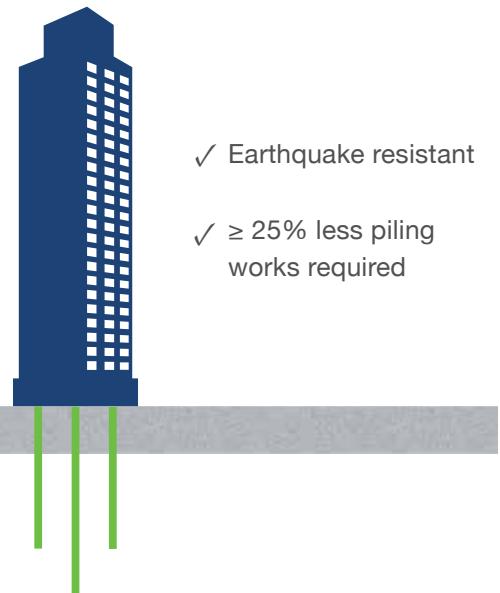


## COMPARISON OF BUILDINGS

**Conventional Building**  
(using red brick walls)



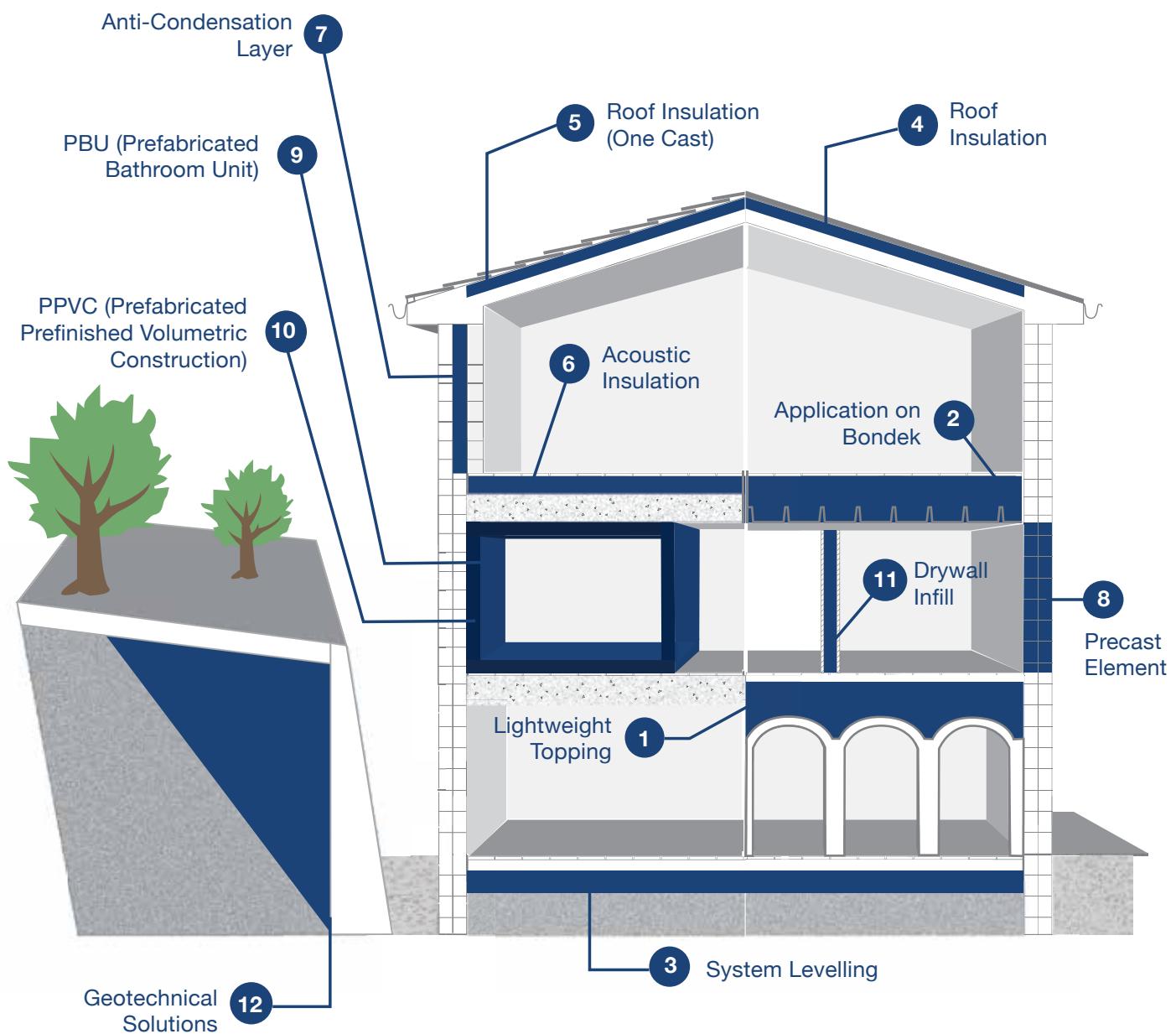
**Lightweight Building**  
(using LIGHTERM)



- ✓ Earthquake resistant
- ✓  $\geq 25\%$  less piling works required

# EXAMPLE OF APPLICATION

Lightherm Screed is used for its thermal insulation, acoustic insulation and lightweight properties.



# 01/ LIGHTWEIGHT TOPPING

## Lightherm Screed **250kg/m<sup>3</sup>**

Lightherm Screed is used as a lightweight topping screed to adjust floor level. In some projects there might be concerns with the usage of conventional cement sand screed, due to its high density of 2100kg/m<sup>3</sup>. Lightherm Screed is an ideal alternative.

### Student Service Centre @ Nanyang Technology University (NTU)



In partnership with a ready-mix company, material mixed in concrete plant



Subsequently sent down to site in the form of ready mix



Able to be used with concrete pump



Pouring of Lightherm Screed

### HDB Block @ Jurong East Street 13



Lift Upgrading Programme, corridor floor level topping up

### HDB Unit @ Whampoa Drive Block 68



Kitchen floor level topping up

### SG Enable (Ministry of Social & Family Development) @ 141 Redhill Road



Walkway level topping up

# 02/ APPLICATION ON BONDEK

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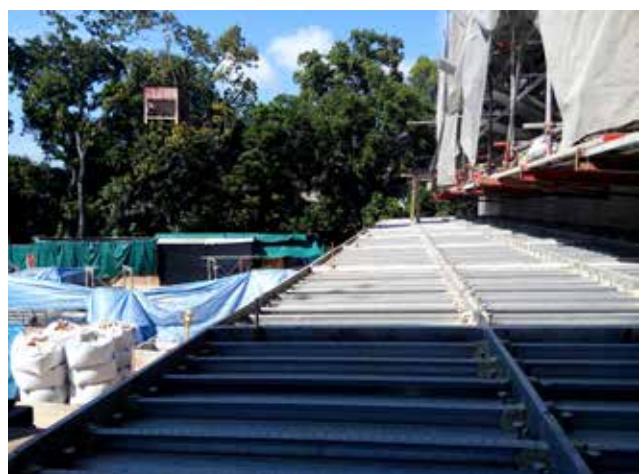
## Lightherm Screed **250kg/m<sup>3</sup>**

Lightherm Screed is used as a lightweight screed on Bondek.

### Bungalow @ 56 Nassim Road, Singapore



Bondek (Steel Decking)



Bondek (Steel Decking)



Casting on site



Casting on site

# 03/ SYSTEM LEVELLING

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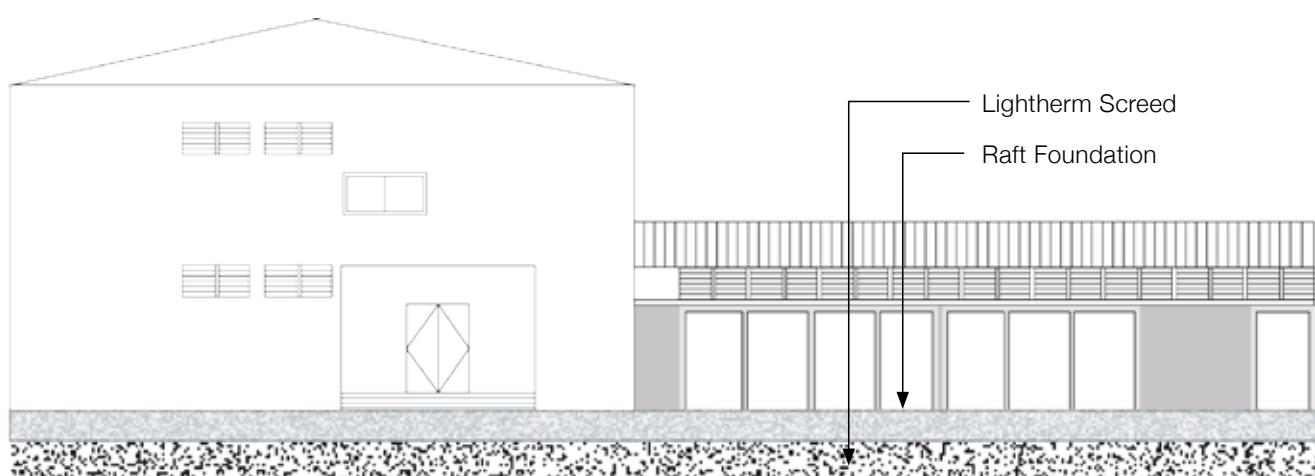
## Lightherm Screed $250\text{kg/m}^3$

Lightherm is used as soil improvement material.

### Bungalow @ 90 Meyer Road, Singapore



Excavated soil is backfilled with Lightherm Screed ( $400\text{m}^3$ ) for its lightweight property. This project utilized the load compensation technique on a soil with poor load bearing capacity. This also prevent potential structural settlement in the long run.



# 04/ ROOF INSULATION

## Lightherm Screed 250kg/m<sup>3</sup>

A 50mm thick Lightherm Screed applied to the roof (inverted roof system) achieved BCA stipulated u-value requirement.\*

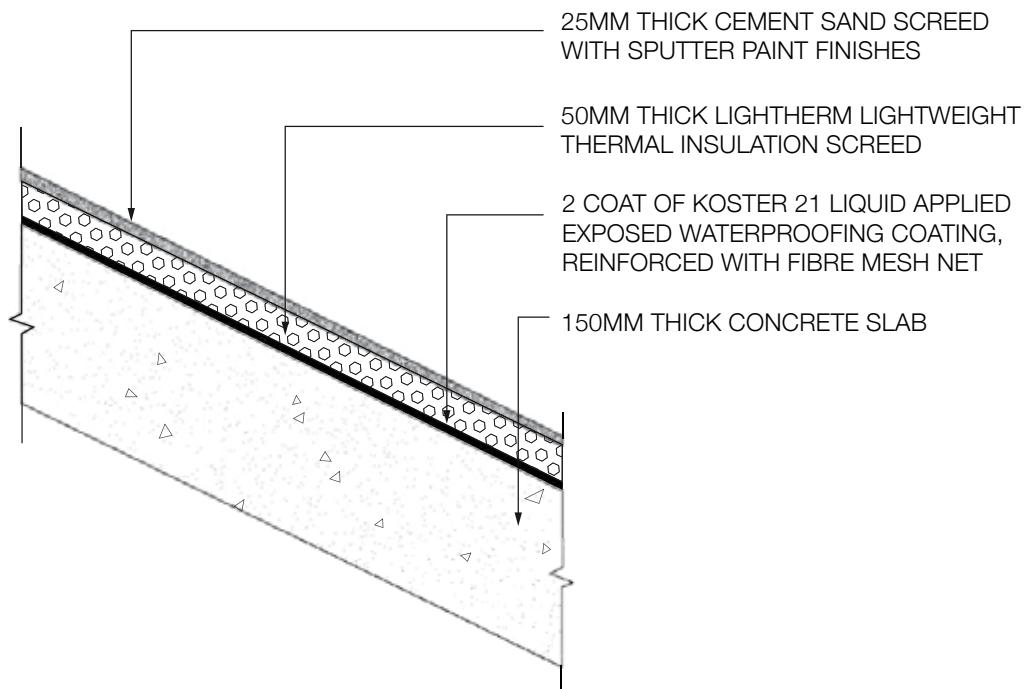
Layer	Thickness, b (m)	Conductivity, k (W/mK)	Resistance, R (m <sup>2</sup> K/W)
Outside Surface, (R <sub>0</sub> )	-	-	0.0550
25mm thick cement sand screed	0.025	0.5330	0.0469
50mm thick Lightherm Screed	0.050	0.0670	0.7463
1.2mm thick KOSTER 21 waterproofing membrane	0.001	0.0826	0.0145
150mm thick concrete slab	0.150	1.4420	0.1040
Inside Surface, (R <sub>i</sub> )	-	-	0.1620
<b>Total Resistance (R<sub>T</sub>)</b>			<b>1.1287</b>

Thermal Transmittance (U-value) of Roof,  $1/R_T$  : 0.89 m<sup>2</sup>K/W

Maximum Allowable U-value of Roof : 1.20 m<sup>2</sup>K/W

$0.89 < 1.20$ , Pass!

\*Contact us for more information.



**Terrace House @ 19 Buckley Road, Singapore**



Lightherm Screed as roof insulation layer



After cement sand screed



After painting works. Final result.

# 05/ ACOUSTIC INSULATION

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## Lightherm Mini Screed **250kg/m<sup>3</sup>**

*Special application, contact us for more information.*

Lightherm Screed is used to reduce airborne sound transmission and reduce impact sound transmissions.

### **Wangz Hotel @ 231 Outram Road, Singapore**



Impact sound of attic level open bar causes disturbance to hotel guests room below



Lightherm Screed is applied to reduce impact sound transmissions

# 06/ ANTI-CONDENSATION LAYER

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## Lightherm Mini Screed **250kg/m<sup>3</sup>**

*Special application, contact us for more information.*

Lightherm Screed can be used as an insulation layer to prevent condensation problem on the external side of building.

### Conservation unit @ 138 Neil Road, Singapore



Computer server room temperature might be as low as 15 degrees, application of 100mm thick Lightherm Screed insulate the slab from moisture condensation problem on the underside. Lightherm casted as a 100mm thick insulation layer.



Subsequently followed by the application of 50mm cement-sand screed

# 07/ PRECAST ELEMENT

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**Lightherm Screed 250kg/m<sup>3</sup> - 1900kg/m<sup>3</sup>\***

\*Various density available, contact us for more information.

Lightherm is incorporated into precast elements to reduce the weight of the final product.

## DSTA Project @ 1 Depot Road, Singapore



Architectural Panel made with Lightherm, weight reduction of more than 55%

## Mosque project in Malaysia



Before the application of Lightherm, precast panel weight was 4kg



After the incorporation of Lightherm, the weight was reduced to 1.67kg

# 08/ PREFABRICATED BATHROOM UNIT (PBU)

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**Lightherm Screed 250kg/m<sup>3</sup> - 1900kg/m<sup>3</sup>\***

*\*Various density available, contact us for more information.*

Lightherm is incorporated into concrete to reduce the weight of Prefabricated Bathroom Unit.

Some other example of possible density and strength: 1000kg/m<sup>3</sup>, achieving 7N/mm<sup>2</sup>  
1200kg/m<sup>3</sup>, achieving 10N/mm<sup>2</sup>  
1400kg/m<sup>3</sup>, achieving 14N/mm<sup>2</sup>  
1900kg/m<sup>3</sup>, achieving 30N/mm<sup>2</sup>

**PBU Project, Singapore**



Density 1000kg/m<sup>3</sup>, achieved compressive strength of 7N/mm<sup>2</sup>



Internal Finishing

# 09/ PREFABRICATED PREFINISHED VOLUMETRIC CONSTRUCTION (PPVC)

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## Lightherm Screed **250kg/m<sup>3</sup>**

*Special application, contact us for more information.*

Lightherm Screed is used as a lightweight leveling material. It plays the role as an infill material. Lightherm Screed also provides good thermal-sound insulation properties.

### Project @ Singapore



During fabrication



Section Detail



After fabrication

# 10/ DRYWALL INFILL

## Lightherm Screed 800kg/m<sup>3</sup>

*Specific design mix, contact us for more information.*

Lightherm is used as an infill material for drywall system. Drywall installation is 35% faster than masonry work. Higher productivity saves construction time and labour cost. Drywall infilled with Lightherm Screed (thickness 87mm) increases room space as per compared to masonry wall (100mm). Its thermal insulation and sound insulation property provides a comfortable environment. Drywall infilled with Lightherm Screed provides solidness and eliminates hollowness.



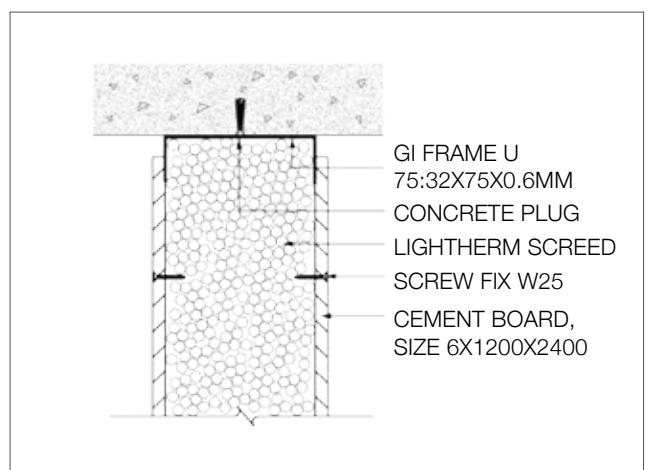
Installation of GI frame



Installation of cement board



Infill of Lightherm into hollow section



Concrete Slab

# 11/ STRUCTURAL APPLICATION

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## Lightherm Screed **1900kg/m<sup>3</sup>**

*\*For specific design mix, please contact us for more information*

Lightherm is added into structural grade concrete at a very minimal dosage to reduce the weight of regular concrete while retaining the compressive strength.

### Cantilever Roof for Temple Project



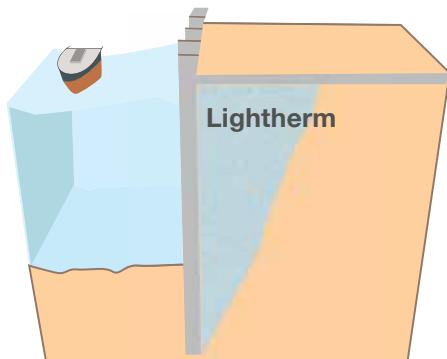
Lightweight concrete is pre-batched in ready mix plant before sending down to site



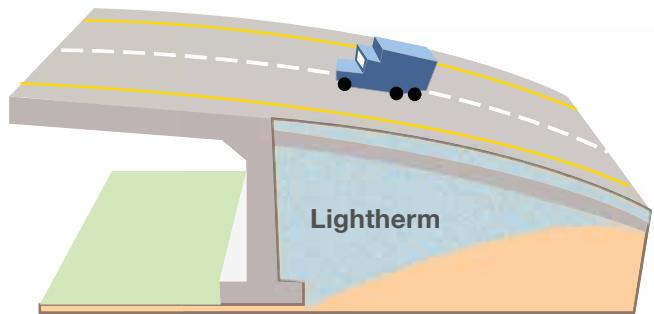
Density 1900kg/m<sup>3</sup> while achieving Grade 40

# 12/ GEOTECHNICAL SOLUTIONS

**Lightherm Scred 250kg/m<sup>3</sup>**  
Special application, contact us for more information.



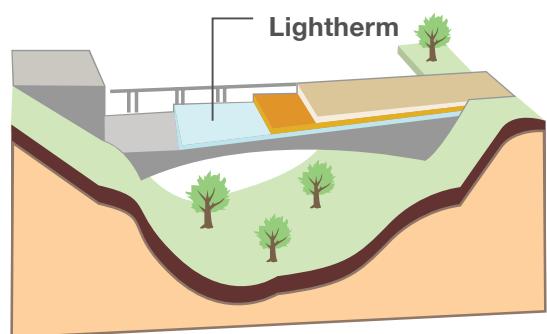
Sheet Piles Wall



Alignment Ramp



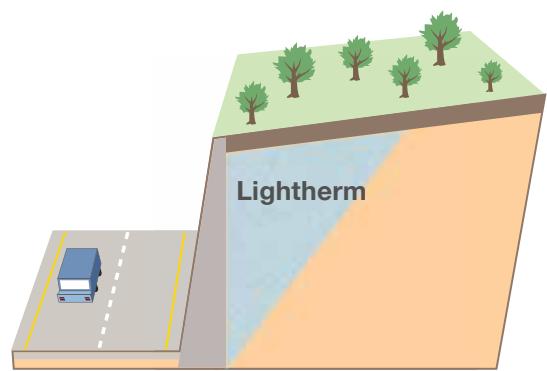
Backfilling on Structures



Roads & Highways



Road Embankment



Supporting walls

# 13/ OTHER APPLICATIONS

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*Special application, contact us for more information.*



Application on wall



Lightweight house



Lightweight insulation bricks



Leveling MRT train track



Elevating swimming pool level



Lightweight precast window



Waterproofing membrane application  
on Lightherm Screed



Lightweight R.C ledge



Lightweight R.C cantilever

# REPORTS

Please contact us for more information.

**ZERTIFIKAT • CERTIFICATE • CERTIFICADO • CERTIFICAT**

**CERTIFICATE OF CONFORMITY**  
No. CLS2 18 03 92266 003  
DLS2 15.06.92266.001

**Certificate Holder:** Vodapruf Pte Ltd  
88 Admiralty Street  
#05-12  
Singapore 757440  
SINGAPORE

**Product:** Thermal Insulation Materials

**Brand Name:** LIGHTHERM

**Model(s):** LIGHTHERM

**Product Details:** Density: 150 kg/m<sup>3</sup>  
(Classification: A3-A1, 40)  
Analytical loss: Tunes generated during  
burning were below EDLH Value  
(R is less than 0.3)

**Standard(s):** EN 13051-1:2007/A1:2009  
BS 6883:1999 Annex B (N > 70-100) (2006)

**Country of Origin:** Malaysia

**Test Report(s):** See CQC Appendix (1 pg.)

**Issued on:** 2016-03-03

**Valid until:** 2018-06-08

**Page 1 of 2**

This Certificate is part of a full report and should be read in conjunction with it. This Certificate remains the property of TÜV SÜD PSB Pte Ltd and shall be returned upon request. The use of this Certificate is subject to TÜV SÜD Group Testing with Certification Requirements: TÜV SÜD PSB Pte Ltd (TÜV SÜD Group Testing with Certification Requirements and TÜV SÜD Product Testing Scheme (PTS) Application Form Sheet). The holder of this certificate is solely responsible for the compliance of any product that bears the same designation as the product type tested. Please refer to this certificate should any warranty be claimed. TÜV SÜD PSB's website at [www.tuv-sud-psb.com](http://www.tuv-sud-psb.com)

TÜV SÜD PSB Pte Ltd • 1 Science Park Drive • Singapore 118221

**TÜV SÜD PSB Pte Ltd**

**Dated 11 MAR 2015**  
Job No C15/0018

**SUBJECT:** Determination of Compressive Strength & Density of Twelve (12) nos of Concrete Cores For DJ Builders & Construction Pte Ltd - proposed Additional & Alteration to an existing 2 Storey Detached House on lot 96977A MK 25 at 90 Meyer Road

**TESTED FOR:** DJ BUILDERS & CONSTRUCTION PTE LTD  
No.8 Ubi Road 2, #08-08 Zervex  
Singapore 408538

Attn: Mr. Eric Loh

**DATE OF TEST:** 11-Mar-15

**TEST METHOD:** The tests were conducted in accordance with BS EN 12390-3: 2009 "Compressive Strength of Test Specimens and BS EN 12390-3: 2009 "Density of Hardened Concrete" for product LIGHTHERM 250

**TESTING LOCATION:** TÜV SÜD PSB Pte Ltd (Tuas Lab) No. 10 Tuas Avenue 10 Singapore 639134

**CHOW WAI HONG**  
TESTING OFFICER

**FARZEEA**  
ENGINEER  
CIVIL ENGINEERING CENTRE

**TÜV SÜD PSB Pte Ltd**

**TEST RESULTS**

Lab Ref	1	2
Sample Ref	B1	B2
Date of Casting	-	-
Age at Test (days)	-	-
Maximum Length as Received (mm)	314.83	298.65
Minimum Length as Received (mm)	311.71	293.87
Average Diameter (mm)	117.22	117.52
Average Height (mm)	120.22	123.65
Mass (g)	335.8	340.9
Density (kg/m <sup>3</sup> )	263.8	259.2
Maximum Load (kN)	10.45	9.91
Compressive Strength at Failure (N/mm <sup>2</sup> )	0.97	0.91

**Page 1 of 11**

**TEST REPORT: 7191110735-CHM15-LYW-R**

Date: 4 MAY 2015 Tel: +65 68851275 Fax: +65 67784301

Client's Ref: Email: songbai.tang@tuv-sud-psb.sg

Note: This report is issued subject to the Testing and Certification Requirements 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**  
Measurement of Thermal Conductivity and Thermal Resistance

**CLIENT**  
VODAPRUF PTE LTD  
88 ADMIRALTY STREET  
#08-12  
SINGAPORE 757440

Attention: WANG

**SAMPLE SUBMISSION DATE**  
21 APR 2015

**DESCRIPTION OF SAMPLE**  
One sample named as "LIGHTHERM 1200" was received.

**DATE OF ANALYSIS**  
23 APR 2015

**TÜV SÜD PSB Pte Ltd**



Laboratory:  
TÜV SÜD PSB Pte. Ltd.  
No 1 Science Park Drive  
Singapore 118221

Regional Head Office:  
TÜV SÜD Asia Pacific Pte. Ltd.  
3 Science Park Drive, #04-0105  
The Franklin, Singapore 118223

Page 1 of 4

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Maximum Load (kN)	10.45	9.91
Compressive Strength at Failure (N/mm <sup>2</sup> )	0.97	0.91

## TECHNICAL CHARACTERISTICS

### Lightherm Screed prepared with Lightherm/Lightherm Mini.

DENSITY Kg/m <sup>3</sup>	250
Mass after 28 days Kg/m <sup>3</sup>	~265
Thermal conductivity - $\lambda$ W/mk	0.067
Compressive resistance N/mm <sup>2</sup> (UNI EN 1015-11:2007)	0.83
Flexural strength N/mm <sup>2</sup> (UNI EN 1015-11:2007)	0.46
Cohesion kPa	82.62
Hot-sealed membrane rupture N/50mm	57.00
Cold-sealed membrane rupture N/50mm	35.00
Elasticity module N/mm <sup>2</sup>	235.80
Permeability to water vapour - $\mu$	11.50
Shrinkage (NBN) - mm/m	0.427
Specific heat - kj/kgK	1.40
Impact sound reduction at 500Hz - $\Delta L$	14 dB thickness 5cm
Impact sound pressure level measure in situ UNI EN ISO 717-2 - $L_{nTW}(C_i)$	61 dB
Fire reactivity class	A2 (UNI EN 13501-1)
Smoke production class	S1 (UNI EN 13501-1)
Observations of drops or inflamed particles	D0 (UNI EN 13501-1)

### PREPARATION OF LIGHTERM SCREED 250KG/M<sup>3</sup>

\*No sand required!



\* Cement Portland 32.5 Cem I or Cem II limestone. Any brand of Ordinary Portland Cement is possible.

Note: 1) Always quantify Lightherm by volume, not by weight

2) Water over dosage will cause segregation



**Mixing Method 1:**  
Small Volume Project

Preparation with cement mixer.  
Mix for 5 minutes.



**Mixing Method 2:**  
Large Volume Project

Preparation with Lightherm  
machine. Mix for 5 minutes.



**Mixing Method 3:**  
Large Volume Project

Purchase Lightherm Screed in  
the form of ready mix. Mix for 5  
minutes.

# PROJECT REFERENCE

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**A: Architect SC: Structural Consultant**

## LIGHWEIGHT TOPPING

**Refurbishment Work @ Marina Bay Sands Intergrated Resort (900m<sup>2</sup>)**

**A: Aedas Pte Ltd**

**SG Enable (Ministry of Social & Family Developement) @ 141 Redhill Road (120m<sup>3</sup>)**  
**A: WOHA Architect | SC: Ronnie & Koh Consultant Pte Ltd**

**Lift Upgrading Works for HDB @ Jurong East Street 13 (1500m<sup>2</sup>)**  
**A: 3P Ecotecture | SC: Lim Kim Cheong Consultant**

**NTU, Student Service Centre (700m<sup>2</sup>)**  
**A: Chung Architect | SC: Fong Consult Pte Ltd**

**Harry's Bar @ Marina bay Link Mall (200m<sup>2</sup>)**  
**SC: Macrobuild Consultants**

**Lift Upgrading Works @ Chua Chu Kang Central (2200m<sup>2</sup>)**  
**SC: Lim Kim Cheong Consultant**

**Bukit Panjang Community Centre (300m<sup>2</sup>)**  
**A: Hiladt Architects LLP**

**Institutional Building for Ministry of Social and Family Development @ 11 Jalan Ubi (150m<sup>2</sup>)**  
**A: SQFT Architect**

**Senoko Road Project (1200m<sup>2</sup>)**

**4 Storey Shop @ 284 River Valley Road (150m<sup>3</sup>)**  
**A: RT+Q Architects | SC: JS Tan & Associate**

**8 Storey Industrial @ 23 Senoko South Road (1200m<sup>2</sup>)**  
**A: Kay Ngee Tan Architect | SC: Ronnie & Koh Consultants Pte Ltd**

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## APPLICATION ON BONDEK

**Bungalow 56 Nassim Road (170m<sup>2</sup>)**

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## SYSTEM LEVELLING

**Bungalow @ 90 Meyer Road (400m<sup>3</sup>)**  
**A: Formwerkz Architects | SC: Portwood & Associates**

## ROOF INSULATION

**NTU, Childcare Centre @ Nanyang Technological University (320m<sup>2</sup>)**

**A: Thymn Pte Ltd | SC: Thymn Pte Ltd**

**Renovation Works @ NEX Serangoon Mall (1200m<sup>2</sup>)**  
**A: SAA Architects | SC: Aecom Singapore Pte Ltd**

**Lakeville Condo @ Jurong West (4000m<sup>2</sup>)**  
**A: Architect 61**

**Bungalow @ 6 Ewart Park (1300m<sup>2</sup>)**  
**A: E9AP Architect | SC: Mega Consultant**

**Terrace House @ 19 Buckley Road (450m<sup>2</sup>)**  
**A: Ip-li Architects | SC: JS Tan & Associate**

**Residential Flat @ 60 Somme Road (400m<sup>2</sup>)**  
**A: Seeds Architect | SC: Longrove & Associates**

**Semi Detached @ 7 Namly Hill (240m<sup>2</sup>)**  
**A: Ip-li Architects**

**10A Bedok Avenue (Approx 200m<sup>2</sup>)**  
**A: RSWA Architects | SC: P&T Consultants Pte Ltd**

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## ACOUSTIC INSULATION

**Wangz Hotel @ 231 Outram Road (50m<sup>2</sup>)**  
**A: Beltiston Ventures (Acoustic Consultant)**

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## ANTI-CONDENSATION LAYER

**NTU, School of Physical & Mathematical Sciences (3000m<sup>2</sup>)**  
**A: Chung Architect | SC: Fong Consult Pte Ltd**

**Conservation Unit @ 136 & 138 Neil Road (40m<sup>2</sup>)**

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## PRECAST ELEMENT

**DSTA @ 1 Deport Road (1200m<sup>2</sup>)**  
**A: HCFA Architect**

**Bungalow@ 22 Mount Sinai Lane (200m<sup>2</sup>)**  
**SC: LC Chua Consulting Engineers**

**Mosque Project @ Malaysia (500m<sup>2</sup>)**

# VODAPRUF

Vodapruf Pte Ltd specializes in supplying high quality construction material in Singapore and Malaysia. We deliver product solution for waterproofing products and lightweight insulation screed (LIGHTERM).

## Our Mission

To provide innovative product solutions for the construction industry

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### Vodapruf Pte Ltd (Singapore HQ)

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Singapore 757440

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E [inquiry@vodapruf.com](mailto:inquiry@vodapruf.com)

### Vodapruf Sdn Bhd (Malaysia, Production)

No. 581, Jalan Idaman 3/7, Taman Perindustrian Senai, 81400, Senai, Johor

T +60 1621 77155

E [inquiry@vodapruf.com](mailto:inquiry@vodapruf.com)

[www.vodapruf.com](http://www.vodapruf.com)

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