LIGHTHERM®
Superlight aggregates for the preparation of lightweight insulation screed
KEY FEATURES

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

- Lighterm has acquired COC (Certificate of Conformity) issued by TÜV SÜD-PSB Singapore
- Listed in Singapore PSB Product Listing Scheme
Lighterm is a lightweight aggregate specially treated with our patented VOD additives. Lighterm when mixed with cement, becomes a lightweight screed (Lighterm Screed) - density of only 250kg/m³. It achieved thermal conductivity - as low as 0.067 W/mk. Lighterm Screed has acquired COC (Certificate of Conformity) issued by TÜV SÜD PSB Singapore. Lighterm Screed is suitable for indoor and outdoor applications.

Lighterm®

Lighterm MINI

- granulometry 3-6mm;
- granulometry 2mm;

Refer to page 22 for mixing procedure
SOME EXAMPLES OF DIFFERENT LIGHTHERM MIXTURE

As LIGHTHERM 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 LIGHTHERM)

✓ Earthquake resistant
✓ ≥ 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/m³

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/m³. 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

Lightherm Screed 250kg/m³

Lightherm Screed is used as a lightweight screed on Bondek.

Bungalow @ 56 Nassim Road, Singapore
03/ SYSTEM LEVELLING

Lightherm Screed 250kg/m³

Lightherm is used as soil improvement material.

Bungalow @ 90 Meyer Road, Singapore

Excavated soil is backfilled with Lightherm Screed (400m³) 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/m³**

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

<table>
<thead>
<tr>
<th>Layer</th>
<th>Thickness, $b$ (m)</th>
<th>Conductivity, $k$ (W/mK)</th>
<th>Resistance, $R$ (m²K/W)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Outside Surface, ($R_o$)</td>
<td>-</td>
<td>-</td>
<td>0.0550</td>
</tr>
<tr>
<td>25mm thick cement sand screed</td>
<td>0.025</td>
<td>0.5330</td>
<td>0.0469</td>
</tr>
<tr>
<td>50mm thick Lightherm Screed</td>
<td>0.050</td>
<td>0.0670</td>
<td>0.7463</td>
</tr>
<tr>
<td>1.2mm thick KOSTER 21 waterproofing membrane</td>
<td>0.001</td>
<td>0.0826</td>
<td>0.0145</td>
</tr>
<tr>
<td>150mm thick concrete slab</td>
<td>0.150</td>
<td>1.4420</td>
<td>0.1040</td>
</tr>
<tr>
<td>Inside Surface, ($R_i$)</td>
<td>-</td>
<td>-</td>
<td>0.1620</td>
</tr>
<tr>
<td><strong>Total Resistance ($R_T$)</strong></td>
<td></td>
<td></td>
<td><strong>1.1287</strong></td>
</tr>
</tbody>
</table>

Thermal Transmittance (U-value) of Roof, $1/R_T$ : 0.89 m²K/W  
Maximum Allowable U-value of Roof : 1.20 m²K/W  

0.89 < 1.20, Pass!  

*Contact us for more information.

25MM THICK CEMENT SAND SCREED WITH SPUTTER PAINT FINISHES  
50MM THICK LIGHTERM LIGHTWEIGHT THERMAL INSULATION SCREED  
2 COAT OF KOSTER 21 LIQUID APPLIED EXPOSED WATERPROOFING COATING, REINFORCED WITH FIBRE MESH NET  
150MM THICK CONCRETE SLAB
Lightherm Screed as roof insulation layer

After cement sand screed

After painting works. Final result.
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

**Lightherm Mini Screed 250kg/m³**

*Special application, contact us for more information.*
06/
ANTI-CONDENSATION LAYER

Lightherm Mini Screed **250kg/m³**
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

Lightherm Screed 250kg/m$^3$ - 1900kg/m$^3$ *
*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
Lightherm is incorporated into concrete to reduce the weight of Prefabricated Bathroom Unit.

Some other example of possible density and strength:

1. 1000kg/m³, achieving 7N/mm²
2. 1200kg/m³, achieving 10N/mm²
3. 1400kg/m³, achieving 14N/mm²
4. 1900kg/m³, achieving 30N/mm²

Lightherm Screed 250kg/m³ - 1900kg/m³*
*Various density available, contact us for more information.
Lightherm Screed 250kg/m³
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

Lightherm

Section Detail

After fabrication
Lightherm Screed 800kg/m³
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.
11/
STRUCTURAL APPLICATION

Lightherm Screed 1900kg/m³
*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/m³ while achieving Grade 40
Lightherm Screed 250kg/m³
Special application, contact us for more information.

Sheet Piles Wall

Alignment Ramp

Backfilling on Structures

Roads & Highways

Road Embankment

Supporting walls
13/ OTHER APPLICATIONS

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
Please contact us for more information.
**TECHNICAL CHARACTERISTICS**

Lightherm Screed prepared with Lightherm/Lightherm Mini.

<table>
<thead>
<tr>
<th>DENSITY Kg/m³</th>
<th>250</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mass after 28 days Kg/m³</td>
<td>265</td>
</tr>
<tr>
<td>Thermal conductivity - $\lambda$ W/mK</td>
<td>0.067</td>
</tr>
<tr>
<td>Compressive resistance N/mm² (UNI EN 1015-11:2007)</td>
<td>0.83</td>
</tr>
<tr>
<td>Flexural strength N/mm² (UNI EN 1015-11:2007)</td>
<td>0.46</td>
</tr>
<tr>
<td>Cohesion kPa</td>
<td>82.62</td>
</tr>
<tr>
<td>Hot-sealed membrane rupture N/50mm</td>
<td>57.00</td>
</tr>
<tr>
<td>Cold-sealed membrane rupture N/50mm</td>
<td>35.00</td>
</tr>
<tr>
<td>Elasticity module N/mm²</td>
<td>235.80</td>
</tr>
<tr>
<td>Permeability to water vapour - $\mu$</td>
<td>11.50</td>
</tr>
<tr>
<td>Shrinkage (NBN) - mm/m</td>
<td>0.427</td>
</tr>
<tr>
<td>Specific heat - kj/kgK</td>
<td>1.40</td>
</tr>
<tr>
<td>Impact sound reduction at 500Hz - $\Delta L$</td>
<td>14 dB thickness 5cm</td>
</tr>
<tr>
<td>Impact sound pressure level measure in situ UNI EN ISO 717-2 - $L'_{10-50}(C_1)$</td>
<td>61 dB</td>
</tr>
<tr>
<td>Fire reactivity class</td>
<td>A2 (UNI EN 13501-1)</td>
</tr>
<tr>
<td>Smoke production class</td>
<td>S1 (UNI EN 13501-1)</td>
</tr>
<tr>
<td>Observations of drops or inflamed particles</td>
<td>D0 (UNI EN 13501-1)</td>
</tr>
</tbody>
</table>

**PREPARATION OF LIGHTHERM SCREED 250KG/M³**

*No sand required!*

- **2 x 0.42m³** Lightherm/Lightherm Mini
- **5 x 50kg** Cement*
- **100 - 120 lt.** Water

= **1m³ of Lightherm Screed 250kg/m³**

* 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

LIGHTWEIGHT TOPPING

Refurbishment Work @ Marina Bay Sands
Intergrated Resort (900m²)
A: Aedas Pte Ltd

SG Enable (Ministry of Social & Family Development) @ 141 Redhill Road (120m²)
A: WOHA Architect | SC: Ronnie & Koh Consultant Pte Ltd

Lift Upgrading Works for HDB @ Jurong East Street 13 (1500m²)
A: 3P Ecotecture | SC: Lim Kim Cheong Consultant

NTU, Student Service Centre (700m²)
A: Chung Architect | SC: Fong Consult Pte Ltd

Harry’s Bar @ Marina bay Link Mall (200m²)
SC: Macrobuild Consultants

Lift Upgrading Works @ Chua Chu Kang Central (2200m²)
SC: Lim Kim Cheong Consultant

Bukit Panjang Community Centre (300m²)
A: Hiladt Architects LLP

Institutional Building for Ministry of Social and Family Development @ 11 Jalan Ubi (150m²)
A: SQFT Architect

Senoko Road Project (1200m²)

4 Storey Shop @ 284 River Valley Road (150m²)
A: RT+Q Architects | SC: JS Tan & Associate

8 Storey Industrial @ 23 Senoko South Road (1200m²)
A: Kay Ngee Tan Architect | SC: Ronnie & Koh Consultants Pte Ltd

APPLICATION ON BONDEK

Bungalow 56 Nassim Road (170m²)

SYSTEM LEVELLING

Bungalow @ 90 Meyer Road (400m²)
A: Formwerkz Architects | SC: Portwood & Associates

ROOF INSULATION

NTU, Childcare Centre @ Nanyang Technological University (320m²)
A: Thymn Pte Ltd | SC: Thymn Pte Ltd

Renovation Works @ NEX Serangoon Mall (1200m²)
A: SAA Architects | SC: Aecom Singapore Pte Ltd

Lakeville Condo @ Jurong West (4000m²)
A: Architect 61

Bungalow @ 6 Ewart Park (1300m²)
A: E9AP Architect | SC: Mega Consultant

Terrace House @ 19 Buckley Road (450m²)
A: Ip-li Architects | SC: JS Tan & Associate

Residential Flat @ 60 Somme Road (400m²)

Semi Detached @ 7 Namly Hill (240m²)
A: Ip-li Architects

10A Bedok Avenue (Approx 200m²)
A: RSWA Architects | SC: P&T Consultants Pte Ltd

ACOUSTIC INSULATION

Wangz Hotel @ 231 Outram Road (50m²)
A: Beltiston Ventures (Acoustic Consultant)

ANTI-CONDENSATION LAYER

NTU, School of Physical & Mathematical Sciences (3000m²)
A: Chung Architect | SC: Fong Consult Pte Ltd

Conservation Unit @ 136 & 138 Neil Road (40m²)

PRECAST ELEMENT

DSTA @ 1 Depot Road (1200m²)
A: HCFA Architect

Bungalow@ 22 Mount Sinai Lane (200m²)
SC: LC Chua Consulting Engineers

Mosque Project @ Malaysia (500m²)
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 (LIGHTHERM).

Our Mission
To provide innovative product solutions for the construction industry

Vodapruf Pte Ltd (Singapore HQ)
8B Admiralty Street #08-12
Singapore 757440
H +65 9796 5910  T +65 6635 5729
E 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

www.vodapruf.com