Product Performance of ALC Panel:

- Low-Carbon Environmental Protection
- Thermal insulation
- Fire resistance
- Light weight & high strength
- Noise insulation & absorption
- Efficient construction
- Economical cost
We actively promotes green architecture and advocates low-carbon life. Because of its low density, our products not only features low raw material consumption, but also reduces carbon emissions during transportation and installation process. The high-performance, low material consumption, good durability and other features of our products meet the controlling requirements of the Green Building Evaluation Standard.

ALC panels are inorganic materials. There is no problem of aging or weathering. The durability is the same as concrete, so they can serve as long as the building lasts. The adhesives used are also inorganic materials like cement, achieving a better overall compatibility and durability. It was first used in a project based in Shanghai more than 70 years ago and remains intact until now.
It is simple, convenient and economical for daily maintenance during the process of using. ALC panels can be recycled after the wall removal without environmental pollution.
**Thermal Insulation**

The inside of ALC panel is composed of many small holes, which are independent and in order. The porosity is nearly 80%. The small holes, filled with air, are not connected and the air inside stays static, so air becomes the major thermal conductivity medium. As the thermal conductivity of air is very low, about 0.026 W/(m • K), which ultimately makes the thermal conductivity of the material very low, thus satisfying the purpose of the insulation.

### External panels of different thickness

<table>
<thead>
<tr>
<th>thickness (mm)</th>
<th>thermal resistance (m².k/W)</th>
<th>thermal inertia index</th>
<th>transfer thermal resistance (m².k/W)</th>
<th>heat transfer coefficient (W/m².k)</th>
</tr>
</thead>
<tbody>
<tr>
<td>50</td>
<td>0.31</td>
<td>0.92</td>
<td>0.46</td>
<td>2.17</td>
</tr>
<tr>
<td>75</td>
<td>0.45</td>
<td>1.31</td>
<td>0.60</td>
<td>1.67</td>
</tr>
<tr>
<td>100</td>
<td>0.59</td>
<td>1.69</td>
<td>0.74</td>
<td>1.35</td>
</tr>
<tr>
<td>125</td>
<td>0.72</td>
<td>2.07</td>
<td>0.87</td>
<td>1.15</td>
</tr>
<tr>
<td>150</td>
<td>0.86</td>
<td>2.45</td>
<td>1.01</td>
<td>0.99</td>
</tr>
<tr>
<td>175</td>
<td>1.00</td>
<td>2.83</td>
<td>1.15</td>
<td>0.87</td>
</tr>
<tr>
<td>200</td>
<td>1.14</td>
<td>3.22</td>
<td>1.29</td>
<td>0.78</td>
</tr>
</tbody>
</table>
Our raw materials and products themselves are inorganic non-combustible materials and have absolute incombustibility, so that they fundamentally do not have the fire safety hazards of most organic insulation materials. Therefore it's a safer product, it has a more economical, reliable energy conservation and better heat insulation.

As the experiments show, there is no strength loss for ALC panel even in a temperature as high as 700°C. A 15cm-thick wall can resist fire for as long as 4 hours. It is an ideal Class A fireproof construction material.

When a fire accident occurs, ALC panel will not release any smoke or toxic gas. Because of the small thermal conductivity, heat is migrated slowly, and even the thinner AAC insulation panel can effectively resist the fire, prevent the spread of fire, and protect the structure from the impact of the fire.
Light Weight & High Strength

High porosity of ALC panels can reduce the bulk density of materials. The absolute dry density of different grade products are 400-600 kg/m$^3$, only 1/5 that of concrete. It can effectively lighten the weight of the building, reduce labor intensity during construction, and save costs in the base and structure of the houses.

Although ALC panel itself is very light, the structure of the material in each direction can balance the load-bearing, and we adopt exact hexahedral cutting size and appropriative thin layer of mortar masonry, so as to highly improve the intensity utilization coefficient.

ALC panel can be used with reinforcing bar according to the design to meet a variety of load-bearing requirements. Reinforcing bar in the panels perform stabilized, toughening and impact resistance functions. Before producing panels, it is necessary to rationally design the plate reinforcement (including: structure and size of reinforcing bar) according to the load requirements of the specific projects, making bearing capacity, shear resistant, stiffness, and deflection indicators to meet the requirements. After production, the panels also need to be tested through sampling to review whether the structure performance meets the load requirements.

<table>
<thead>
<tr>
<th>Item</th>
<th>Standard value</th>
<th>measured value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dry density grade (kg/m$^3$)</td>
<td>≤525</td>
<td>486</td>
</tr>
<tr>
<td>Strength grade</td>
<td>≥2.5</td>
<td>3.5</td>
</tr>
<tr>
<td>Thermal performance</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Thermal conductivity [W/(m$^3$*k)]</td>
<td>0.15</td>
<td>0.13</td>
</tr>
<tr>
<td>thermal storage coefficient</td>
<td></td>
<td>2.75</td>
</tr>
<tr>
<td>Frost resistance(15 times)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Quality loss (%)</td>
<td>≤5.0</td>
<td>0.7</td>
</tr>
<tr>
<td>Strength after freezing(MPa)</td>
<td>≥2.0</td>
<td>3.3</td>
</tr>
<tr>
<td>Drying contraction(mm/m)</td>
<td>≤0.8</td>
<td>0.5</td>
</tr>
<tr>
<td>Bond strength of reinforcement and ALC panel (MPa)</td>
<td>≥0.5</td>
<td>1</td>
</tr>
<tr>
<td>structural performance (uniformly distributed load)</td>
<td>Loading to 310N/m$^2$, last still for 10min, no crack on the panel</td>
<td></td>
</tr>
<tr>
<td>Single point hanging power(N)</td>
<td>≥800</td>
<td>1290</td>
</tr>
</tbody>
</table>
Noise Insulation & Absorption

Depending on different thickness and surface treatment of the wall, noise insulation of the ALC panel is 40-60 DB. ALC panels have closed porous characteristics, so it is also a good kind of sound-absorbing material. ALC panel has dual nature, sound absorption & sound resistance, which other building materials do not have.

Impermeability & Damp Proofing

Study shows that besides structural reasons, the seepage of external walls is generally infiltrated from the masonry mortar joint, but ALC panels mainly use special adhesive mortar joint denser than ordinary masonry mortar joint, thus they greatly reduce the seepage probability. Our technical ability ensures that the inside holes of ALC products are independent closed holes, and their diameter is about 1-2mm, so that they can prevent the moisture diffusion effectively.
**Efficient Construction**

Precise Size

Our ALC products are of precise sizes and the tolerance of length, height and width is +1.0mm. Precise sizes make it possible to avoid cracking by the way of coating thin mortar and putty.

Dry Construction

Our aerated concrete products can be installed by the way of dry masonry continuous operation. They are not restricted from the height of one time masonry, so they can highly improve the speed of construction. When special adhesive is used to dry masonry installing our blocks, it does not need watering in the surface of blocks to be wet. After installation, the surface of AAC product walls can be directly coated with putty. Without watering and heat conservation, it effectively reduces cracks caused by masonry wall shrinkage as a result of expansion and contraction due to change of water content. It not only reduces the construction difficulty, but also is conducive to the quality of the project and shortens project period.

Good Processing Ability

Easier to process than wooden products, our products can be processed simply into different shapes as per your demand. They are easy to groove and do not need much time spent in cutting. Various processing methods like sawing, drilling, nailing, hanging, craving and coating thin-layer mortar make it easier and more flexible to bury pipeline and do second decoration.
**Economical Cost**

Project period shortened by as much as 2/3

ALC panel is lightweight and easy-processed, which may ease labor intensity. Internal and external walls can be constructed at the same time, so construction speed is faster and labor costs are reduced. ALC panel is masoned and coated by dry powder mortar. Heat insulation time is reduced, project time is shortened by about 2/3, so that capital turnover is expedited.

Low Basic Investment

ALC panel is lightweight and high strength so as to reduce a series of investments for maintaining structure weight. Reducing floor loading and weight can not only decrease the base cost, but also reduce the quantity of steel bars or size of concrete beams, columns and floor panels, so the whole project cost is lowered.

Our ALC wall panel are used as wall materials that highly increase the usable area of the buildings and reduce energy consumption. ALC internal panels are the thinnest among those with the same capacity in sound insulation and fire protection. There is no need to use structural post, beam and other auxiliary components so that wall loading is decreased and building cost is reduced as well.

Good Anti-Cracking Ability

Shrinkage rate of our ALC products is much smaller than national standard 0.5mm/m and other wall materials. The smaller the dry shrinkage rate, the better the anti-cracking ability. Moreover, dry construction avoids wall cracking because of dry shrinkage. ALC panel is masoned by special mortar whose thickness is only 3mm, so cracking possibility of the gap is greatly lowered. Wall is elastically connected, which is beneficial to avoid cracking even if the base subsides.
ALC (Autoclaved Aerated Lightweight Concrete) Offers considerable advantages over other construction materials:

Advantages:

• Our panel consist of steel-reinforced net, which increase it’s quality and strength, allowing it to carry load of 50kg per point. Steel-reinforced mesh prevent panel from breaking into small pieces, which greatly reduce accident and waste (unusable panel).
• Greatly reduce the use of grout for plastering to level wall surface.
• Improved thermal efficiency reduces the cooling and heating load in buildings.
• Workability allows accurate cutting, which minimizes the generation of solid waste during use.
• Resource efficiency gives it lower environmental impact in all phases of its life cycle, from processing of raw materials (using less cement) to the disposal of waste.
• Light weight saves cost & energy in transportation.
• Light weight saves labor expenses due to easy installation. The material can be easily routed, sanded and cut on-site.
• Light weight increases chances of survival during seismic activity.
• It has excellent fire resistance.
• It has excellent sound insulation.

Localized Advantages:

• The advantages of the prefabricated partition system include ease of installation and replacement. This means home owners can easily improve their home layouts according to their needs and remodel their homes when desired. The prefabricated partition walls are also lightweight as compared to brickwall and have better quality finish.
• With the great saving of labour, as high as 60%. the Labour Saving Indices (LSI) under the BCS Buildability Score for Lightweight precast concrete panel is 0.9 as compare to brickwall of 0.3.
• It meet/exceed Singapore government fire resistance requirement.
• It meets Singapore government Non-combustibility requirement.
• It meets Singapore government Impact test/strength requirements.