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Powerblock distribution area
AUTOCLAVED AERATED CONCRETE or AAC Block is lightweight concrete made from silica sand, cement, lime, and aluminum paste as a foaming agent, as an alternative material for building walls. When compared with clay brick material, this product has several advantages, such as; lightweight, precision.

since the 1980s, AAC blocks are increasingly being used in the construction industry in various parts of the world due to the lightweight but strong AAC characteristics, which can reduce the cost of building structures. AAC is also known for materials that have good temperature insulation and sound insulation, and are environmentally friendly

using of natural materials in the technology of the building materials industry, such as; silica sand, and lime have been known since the end of the 19th century at the beginning of the 20th century the production process was enhanced by the introduction of the addition of a system of steam pressure or steam curing.

This is the starting point for the introduction of a new building material, namely; lightweight aerated concrete (Autoclaved Aerated Concrete / AAC)

aerated lightweight concrete (Autoclaved Aerated Concrete / AAC), is a lightweight high-strength building material, and has good insulation against heat and sound.

This material strength is obtained from the curing process by using water vapor pressure in an autoclaved unit, the reaction between lime, aluminum paste and silica sand there is a temperature around 1830 Celsius, will form a new substance, which is called; TOBERMORITE, - will got a stretching process that produces countless pores. the entire process and the resulting substance provide exceptional mechanical and physical characteristics of powerblock lightweight aeration concrete.
AAC Powerblock has the advantage of being stronger, lighter, practical and economical compared to the use of clay brick, so it is suitable for use as building wall materials.

The mixing process of raw material for making AAC Powerblock is controlled by using a computer, so that homogeneous quality and stable aeration are obtained, so that it produces lightweight concrete, or which is known on the market with the name of lightweight brick, which has high compressive strength and has a light specific gravity.

AAC Powerblock is also easy to cut using ordinary hand saws or drilled. Nature that has good temperature insulation, makes AAC Powerblock very appropriate for use in buildings that require insulation against temperature and sound, such as in laboratory buildings, swallow bird houses, generator sets, and sports facilities.
different from other concrete materials, AAC Powerblock is made using raw materials that do not exceed the size of the sand grains. silica sand, lime, water, cement as a binder and aluminum paste in the amount of 0.05-0.08% per volume (depending on the density to be made).

When this light brick dough will be formed and become a green cake, there will be a chemical reaction between silica sand and aluminum paste which forms many micro air bubbles, which results in an increase in the volume of green cake, which will produce a lightweight material with good temperature insulation.

when green cake removed from the mold, the AAC Powerblock is being square form but still soft, after being cut into blocks or panels, the AAC powerblocks are placed in to Autoclaved for 12 hours, during the hardening process by using hot steam with a temperature of 190 Celsius and pressures of 8-12 bar, silica will react with calcium hydroxide to make AAC Powerblock stronger. after that AAC Block can only be used as building material.
in the process of making AAC Powerblock, quality has been controlled in a laboratory using the DIN (Deutsche Industrie Norm) standard, quality testing includes; compressive strength, thermal resistant, sound proof, water absorption, moisture content, and shrinkage.
1. International Standard

AAC Block is a product that is widely known internationally, and has industry standard raw materials, so AAC Powerblock also has the same standard.

2. Environment Friendly

AAC PowerBlock is made from non-toxic materials, and is resistant to all weather, AAC Powerblock can also be recycled.

3. Lightweight

AAC Powerblock weights has 1/5 of ordinary concrete weight, or 1/2 of clay brick weight, so it is easy to install with simple equipment as a wall.

4. Precision

AAC Powerblock has its own standardization which ensures that the Block product are always precise in shape
5. Sound Proof

AAC Powerblock is very suitable to be applied in a room that demands soundproof and good temperature insulation.

6. Fast and easy to install

because AAC Powerblock is lightweight and precise, the installation process is easy even with simple hand tools.

7. Not curved

AAC Powerblock, has a flat and porous surface.

8. Economical

AAC Powerblock's advantages can reduce labor costs, and reduce the cost of building structures.
9. Non-Toxic

AAC Powerblock is made from non-toxic materials, so it is very safe to use by humans and the environment.

10. Fire Proof / Thermal resistant

AAC Powerblock is made of inorganic materials which are relatively has fire resistant, suitable applications for emergency staircase, ventilation chimneys and elevator corridors. Heat insulation properties can reduce increase in room temperature, thus making the room cooler.
1. Lighter weight

AAC Powerblock is the only lightweight material with a specific gravity of 575 kg / m³, which can be used as a filler wall, one block with a length of 60 cm, height 20 cm, and a thickness of 10 cm, weighing only 6.9 kg (6 kg in dry conditions).

because it has a homogeneous structure and light weight, which is only 1/5 of the weight of conventional concrete, Powerblock products can reduce the forces caused by the earthquake and reduce the load borne by the structure. Other facilities obtained due to this light weight are product easily handling and transportation.

the ratio of building weight per 1 m³

<table>
<thead>
<tr>
<th>Material</th>
<th>Specific Weight (Kg / M³)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reinforced concrete</td>
<td>2400</td>
</tr>
<tr>
<td>Concrete Hollow Block</td>
<td>1650</td>
</tr>
<tr>
<td>Clay brick</td>
<td>1500</td>
</tr>
<tr>
<td>AAC Powerblock</td>
<td>550 - 650</td>
</tr>
</tbody>
</table>

2. Low water absorption

although the composition of AAC Powerblock consists mostly of pores, this does not make AAC Powerblock have a high water absorption, because in the steam-curring process during the production process causes the pore structure of this material to crystallize. the result is that one pore with another pore has a fairly
high impermeability, then the process of absorption of water only occurs in the outermost layer, after that the layer will be protective for further water absorption.

<table>
<thead>
<tr>
<th>Material</th>
<th>BERAT (kg/m²·h⁻⁰·⁵)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Clay brick</td>
<td>22 - 30</td>
</tr>
<tr>
<td>AAC Powerblock</td>
<td>4 - 6</td>
</tr>
</tbody>
</table>

3. FIRE RESISTANT

AAC Powerblock® is a ‘Non-combustible’ (non-flammable) and because of its low heat conductivity, the heat flow in this material is very small. The result is a material that has high resistance to fire. AAC Powerblock®

Even used to protect other materials, such as steel or concrete. Therefore, in many developed countries, the use of this type of aerated lightweight concrete can reduce the cost of fire insurance premiums, and it is recommended to partition data processing and storage rooms such as computer rooms and archive rooms because they are fire resistant.

4. LOW SHRINKAGE LEVEL

The problem of cracking on the wall is a classic problem that is often encountered. The causes of cracking itself can be grouped in 2 ways, namely:
A. External factors
Caused by movements outside the material itself, such as column structure movements, deflection of beams or floors and other external forces such as collisions and so on.

b. Internal factors
Caused by the movement of the wall material itself such as shrinkage and expansion of wall material, plastering or wall adhesives.
AAC Powerblock® has smaller shrinkage thereby reducing wall cracks due to internal factors.

Comparison of dimensional changes due to expansion and shrinkage

<table>
<thead>
<tr>
<th>Material</th>
<th>CHANGE DIMENSIONS (mm / m)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Clay Brick</td>
<td>Until 1.8 (+)</td>
</tr>
<tr>
<td>Concrete Block</td>
<td>Until 0.8 (-)</td>
</tr>
<tr>
<td>Concrete</td>
<td>Until 0.7 (-)</td>
</tr>
<tr>
<td>Concrete Hollow Block</td>
<td>Until 0.4 (-)</td>
</tr>
<tr>
<td>AAC PowerBlock</td>
<td>Until 0.2 (-)</td>
</tr>
</tbody>
</table>

(+) Expansion (-) Shrinkage

5. HIGH RESISTANCE TO PRESSURE

AAC Powerblock® has a compressive strength of 4.25 N / mm² for a specific gravity of 600 kg / m³. When examined from its weight, this material has relatively high strength. No other building material can reach this level. This power is formed from the substance Tobermorite contained in AAC Powerblock®. Because its strength is reliable and
measured in many countries, especially in areas that are often affected by earthquakes.

6. GOOD SOUND INSULATION

AAC Powerblock® is a better sound insulation compared to other building materials. Studies have shown that AAC Powerblock® provides 37 db higher sound insulation than expected when compared to its weight. This performance is obtained because AAC Powerblock® converts acoustic energy to heat energy more than any other material.

7. ACCURACY IN SIZE

Standard quality and quality of the production process guarantee AAC Powerblock® has an accurate size with a tolerance of length + 2 mm, height + 2 mm, width + 2 mm. The accuracy of this measure will facilitate the implementation of work in the field and the final result is neater. This high size accuracy also allows the use of thin adhesives, which are quite 2 - 3 mm thick and allow finishing by directly Skim coat without plastering.

8. ENVIRONMENTALLY FRIENDLY

AAC Powerblock® is an environmentally friendly, non-toxic and harmless product. The material used cannot be used as a residence for fleas, insects and other similar animals.
9. DURABLE

AAC Powerblock® is resistant to weather changes, durable and stable.

10. HIGH RESISTANCE TO EARTHQUAKE

Lateral force planning that works on a building because of an earthquake is largely determined by the mass (weight) of the building and ground acceleration due to the earthquake. Simply put, the lateral force of earthquake acting on a building is based on Newton's famous formula. There are several other factors that also affect the earthquake force for example the type of soil under the foundation and the level of flexibility of the building structure. The illustration above shows that the lightweight of AAC Powerblock® basically provides benefits in earthquake design. AAC Powerblock® can break down the mass of the structure and automatically minimize the effect of earthquake forces on the building. In addition, the nature of AAC Powerblock® which is non-flammable and fire-resistant is protective against fires that usually occur with an earthquake. AAC Powerblock® has long been used in earthquake-prone areas such as in Aceh, Yogyakarta and Padang. Buildings that use AAC
Powerblock® both in whole or in part actually have good earthquake resistance.
1. EASY AND QUICK INSTALLATION

The use of AAC Powerblock® for construction has been proven more efficient. Its light and strong weight makes it easy installation and handling in the field. AAC Powerblock® products can be saw, drilled, nailed or formed using ordinary wood equipment. So the work is faster and more easily compared to using building materials other conventional.

**BRICK + CEMENT CONVENTIONAL = + 8m² / day**

**POWER BLOCK + INSTANT CEMENT POWERBOND = + 15 m² / day**
2. MORE ECONOMIC

With the characteristics it has, the foundation load is borne become smaller thus reducing the cost of structure, development finish faster, no need for additional material for insulation sound & thermal, breaking down the level of material loss at the time development, reduce fire insurance premium costs save on electricity usage costs.

3. PROPERTY VALUE

AAC Powerblock gives added value to every building that uses it. Such as high resistance to fire and earthquakes, the results of the work neater, energy efficient, more comfortable and sturdy.

4. POWERBLOCK BUILDING SYSTEM

AAC Powerblock blocks can be used as wall fillers or insulation. Powerblock can be installed horizontally, vertically and can function as an aesthetic element in the construction of residential buildings, low-rise and high-rise buildings.
low-rise buildings
- Interior walls
- Outer wall
- Variation / decoration
- Balcony
- Emergency Stair Area
- Security fence
- Local heights with light / human loads

high-rise building
- Interior walls
- Exterior walls
- Balcony
- Emergency Stair Area
- Wall Shaft Utility
- Security fence
- Local elevation with light / human load
STANDARD BLOCK SIZE

<table>
<thead>
<tr>
<th>Length (mm)</th>
<th>600</th>
<th>Dry Density (kg/M$^3$)</th>
<th>550 ± 50</th>
</tr>
</thead>
<tbody>
<tr>
<td>Height (mm)</td>
<td>200</td>
<td>Compressive Strength (N/mm²)*</td>
<td>&gt; 4.00</td>
</tr>
<tr>
<td>Width (mm)</td>
<td>75, 100, 125, 150, 200</td>
<td>Pallet Dimensions (m)</td>
<td>1.00 x 1.20</td>
</tr>
</tbody>
</table>

Note: pallet weight of size 1.00 x 1.20 = 23 kg
* in accordance with the provisions of the laboratory test method

<table>
<thead>
<tr>
<th>Thick</th>
<th>mm</th>
<th>75</th>
<th>100</th>
<th>125</th>
<th>150</th>
<th>200</th>
</tr>
</thead>
<tbody>
<tr>
<td>Block Volume</td>
<td>M$^3$</td>
<td>0.009</td>
<td>0.012</td>
<td>0.015</td>
<td>0.018</td>
<td>0.024</td>
</tr>
<tr>
<td>Volume / Pallet</td>
<td>M$^3$</td>
<td>1.80</td>
<td>1.80</td>
<td>1.80</td>
<td>1.80</td>
<td>1.92</td>
</tr>
<tr>
<td>Quantity Block / Pallet</td>
<td>Pcs</td>
<td>200</td>
<td>150</td>
<td>120</td>
<td>100</td>
<td>80</td>
</tr>
<tr>
<td>Quantity Block / M$^3$</td>
<td>Pcs</td>
<td>111</td>
<td>83</td>
<td>67</td>
<td>56</td>
<td>42</td>
</tr>
<tr>
<td>Weight Block / M3 Without Pallet</td>
<td>Kg</td>
<td>1125</td>
<td>1125</td>
<td>1125</td>
<td>1125</td>
<td>1120</td>
</tr>
<tr>
<td>Height of Packing Include Pallet</td>
<td>Mtr</td>
<td>1.62</td>
<td>1.62</td>
<td>1.62</td>
<td>1.62</td>
<td>1.72</td>
</tr>
<tr>
<td>Wall Area That Can Be Built From 1M3 of Block</td>
<td>M$^2$</td>
<td>13.33</td>
<td>10.00</td>
<td>8.00</td>
<td>6.67</td>
<td>5.00</td>
</tr>
</tbody>
</table>
**JUMBO BLOCK SIZE**

<table>
<thead>
<tr>
<th>Dimension</th>
<th>Length (mm)</th>
<th>Height (mm)</th>
<th>Width (mm)</th>
<th>Dry Density (kg/M$^3$)</th>
<th>Compressive Strength (N/mm$^2$)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>600</td>
<td>300</td>
<td>75, 100, 125, 150, 200</td>
<td>550 + 50</td>
<td>&gt; 4.00</td>
</tr>
</tbody>
</table>

**Note:** pallet weight of size 1.00 x 1.20 = 23 kg

* in accordance with the provisions of the laboratory test method

<table>
<thead>
<tr>
<th>Thick</th>
<th>mm</th>
<th>75</th>
<th>100</th>
<th>125</th>
<th>150</th>
<th>200</th>
</tr>
</thead>
<tbody>
<tr>
<td>Block Volume</td>
<td>M$^3$</td>
<td>0.0135</td>
<td>0.0180</td>
<td>0.0150</td>
<td>0.0270</td>
<td>0.0360</td>
</tr>
<tr>
<td>Volume / Pallet</td>
<td>M$^3$</td>
<td>1.76</td>
<td>1.80</td>
<td>1.80</td>
<td>1.78</td>
<td>1.73</td>
</tr>
<tr>
<td>Quantity Block / Pallet</td>
<td>Pcs</td>
<td>130</td>
<td>100</td>
<td>80</td>
<td>66</td>
<td>48</td>
</tr>
<tr>
<td>Quantity Block / M$^3$</td>
<td>Pcs</td>
<td>74</td>
<td>56</td>
<td>44</td>
<td>37</td>
<td>28</td>
</tr>
<tr>
<td>Weight Block / M3 Without Pallet</td>
<td>Kg</td>
<td>1100</td>
<td>1125</td>
<td>1125</td>
<td>1114</td>
<td>1080</td>
</tr>
<tr>
<td>Height of Packing Include Pallet</td>
<td>Mtr</td>
<td>1.62</td>
<td>1.62</td>
<td>1.62</td>
<td>1.77</td>
<td>1.72</td>
</tr>
<tr>
<td>Wall Area That Can Be Built From 1M3 of Block</td>
<td>M$^2$</td>
<td>13.33</td>
<td>10.00</td>
<td>8.00</td>
<td>6.67</td>
<td>5.00</td>
</tr>
</tbody>
</table>
STEP 1

- Prepare Sloof and foundation
- Pull the thread between the corners of the wall, use a waterpass

STEP 2

- Prepare the Powerbond PRO-788R SCREED dough to make the floor base
- Apply evenly to the surface of the floor

STEP 3

- Place the Powerblock® AAC Blocks above the Powerbond TM mix
- PRO-788R the SCREED
- Press until the thickness of the Powerbond TM PRO-788R SCREED is mixed flat with the thread surface
- Check the block evenness with waterpass
STEP 4
- Mix THIN BED MORTAR Powerbond Lightweight brick with water in a bucket. Stir with a trowel or mixer until blended

STEP 5
- Glue the vertical part of the block with THIN BED MORTAR Powerbond
- Place the blocks at each end of the wall, then check the grade again with waterpass

STEP 6
- Clean the surface of the block every time you install a new layer
- Pull the thread to the wall alignment and use the appropriate trowel block width
- Apply THIN BED MORTAR Powerbond in the vertical direction, then in the horizontal direction
- Ensure that the entire surface of the block is covered with a stir
STEP 7
- Lift the surface that faces the vertical stir
- Put opposite sides of the block first
- Pinch the block with a rubber hammer
- Keep the thickness of the adhesive + 3 mm

STEP 8
- Clean the excess THIN BED MORTAR Powerbond with a trowel or Spoon cement
- Use this untidy cement to patch the hollow blocks

STEP 9
- Permitted overlap distances
STEP 10
- Use scraper / leveling tools to smooth the bulge of blocks on the wall surface
- Or you can also use broken blocks to level the wall surface
- Use sandpaper boards to smooth broad surfaces

HOW TO CUT BLOCK
- To cut the Powerblock block guide line with angle iron
- Then cut the block with a handsaw

MAKE ARCHIVE SHAPES
- Arrange the walls beyond the planned curve
- Make curved lines
- Cut with a saw / grinding
  Perfect with stucco
CREATE WALL LINE FOR PIPE INSTALLATION

- Make a mark on the wall with a pencil
- Use a circular saw to cut
- Remove components not used by the tool
- Scrape off with a hand router to tidy up the remaining parts

MAKE THE HOLE STOP CONTACT

- Make lines according to size
- Cut with a grinding wheel
- Chisel unused remnants
• Vertical groove depth <1/3 of block thickness
• Cover the surface with stucco
• For depths > 1/3 the thickness of the block, use / attach wire mesh before plastering

USE OF "FLEXIBLE-TOGETHER" AND "REBAR"

A. In The Structure Column
The following is an illustration of the Flexible joint around the Structure. flexible joint in the form of a THIN BED MORTAR Powerbond mix thickness + 10-20 mm
B. In the practical column

Here follows a framework in the form of a practical column and a practical beam.
B.1. Vertical Cross Section

B.2. Horizontal Cut Section
Wall Frame

The illustration on the right shows the arrangement of the Powerblock® Block with the ends meeting each other with a practical column.

Recommended block thickness of at least 100 mm, maximum wall height of 3 meters with THIN BED MORTAR Powerbond.
The illustration below shows the arrangement of the Powerblock Block with the edges meeting each other symmetrically.

Recommended block thickness of at least 100 mm, maximum wall height of 3 meters with THIN BED MORTAR Powerbond
The following is a reference table for the area of the infill wall sandwiched between 4 sides:

<table>
<thead>
<tr>
<th>Height (M)</th>
<th>Length (M)</th>
<th>2,50</th>
<th>3,00</th>
<th>3,50</th>
<th>4,00</th>
<th>4,50</th>
<th>5,00</th>
<th>5,50</th>
<th>6,00</th>
</tr>
</thead>
<tbody>
<tr>
<td>2,50</td>
<td>75</td>
<td>75</td>
<td>75</td>
<td>100</td>
<td>100</td>
<td>100</td>
<td>100</td>
<td>100</td>
<td>100</td>
</tr>
<tr>
<td>3,00</td>
<td>75</td>
<td>75</td>
<td>100</td>
<td>100</td>
<td>100</td>
<td>125</td>
<td>125</td>
<td>125</td>
<td>125</td>
</tr>
<tr>
<td>3,50</td>
<td>100</td>
<td>100</td>
<td>100</td>
<td>125</td>
<td>125</td>
<td>125</td>
<td>150</td>
<td>150</td>
<td>150</td>
</tr>
<tr>
<td>4,00</td>
<td>125</td>
<td>125</td>
<td>125</td>
<td>125</td>
<td>125</td>
<td>150</td>
<td>150</td>
<td>175</td>
<td>175</td>
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<td>4,50</td>
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<td>150</td>
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<td>175</td>
<td>175</td>
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</tr>
</tbody>
</table>

The following is a reference table for the area of the infill wall sandwiched between 3 sides (U side):

<table>
<thead>
<tr>
<th>Height (M)</th>
<th>Length (M)</th>
<th>2,50</th>
<th>3,00</th>
<th>3,50</th>
<th>4,00</th>
<th>4,50</th>
<th>5,00</th>
<th>5,50</th>
<th>6,00</th>
</tr>
</thead>
<tbody>
<tr>
<td>2,50</td>
<td>75</td>
<td>75</td>
<td>75</td>
<td>100</td>
<td>100</td>
<td>100</td>
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<td>100</td>
</tr>
<tr>
<td>3,00</td>
<td>75</td>
<td>75</td>
<td>100</td>
<td>100</td>
<td>100</td>
<td>125</td>
<td>125</td>
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<td>3,50</td>
<td>100</td>
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<td>125</td>
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<td>125</td>
<td>150</td>
<td>150</td>
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</tr>
<tr>
<td>4,00</td>
<td>125</td>
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<td>125</td>
<td>125</td>
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<td>150</td>
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<td>4,50</td>
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<td>150</td>
<td>150</td>
<td>175</td>
<td>175</td>
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</tr>
</tbody>
</table>
PT Power Block Indonesia products have spread from Sabang to Merauke, and have even penetrated the Malaysian market since 2009.

PT Power Block Indonesia will continue to be a good partner for all our customers. Quality products, professional workforce and your trust are our commitments in providing the best solutions in the construction sector.

PT Power Block Indonesia's products have been used in various regions such as:

- Jakarta,
- Depok,
- Tangerang,
- Banten,
- Cikarang,
- Cilegon,
- Bogor,
- Bandung,
- Semarang,
- Magelang,
- Yogyakarta,
- Subang,
- Surabaya,
- Bali,
- Palembang,
- Padang,
- Medan,
- Pekanbaru,
- Islands Riau,
- Lampung,
- Manado,
- Makassar,
- Banjarmasin
- Samarinda,
- Pontianak,
- Tenggarong,
- Timika,
- etc.