The product Of Tomorrow
The Responsibility Of Today

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PARIN BETON

Autoclaved
Aerated Concrete

The product of tomorrow

The responsibility of today

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About Parin Beton Amood

Parin Beton Amood Company is a leading manufacturer of Autoclaved Aerated Concrete (AAC), an innovative building material that has been widely used throughout the world in various climate and conditions.

Parin Beton Amood plant, with daily production of over 1,550 m3 of Autoclaved Aereated Concrete and 150 Tons of Thin Joint Mortar is the larget plant in Iran.

Committed to quality and keeping up with the latest advancement in building material technology the Company entered a contract with HESS GROUP (Germany) for Autoclaved Aerated Concrete and LAHTI Precision (Finland) for Dry Mortar Plant. These plants have been constructed in a 20,000 m2 of land near Mashad, Iran and include the following production units :

- **Autoclaved Aerated Concrete (AAC) Production Plant with a daily capacity of 1550 m3 licensed by HESS GROUP (Germany).**
- **Dry Mortar Production Plant with a daily capacity of 150 tons licensed by LAHTI Precision OY.**
- **Silica Sand Crushing and Processing Unit with a daily capacity of 500 tons.**
- **Lime Stone Crushing and Processing Unit with a daily capacity of 500 tons.**
- **Lime Stone Milling Plant**
- **Quick Lime Plant with a daily capacity of 150 tons.**
- **Quick Lime Milling Plant with a daily capacity of 150 tons.**

Parin Beton Products

1- **Autoclaved Aerated Concrete (AAC) Blocks with daily capacity of 1550m3.**

2- **Thin Joint Mortar for AAC Blocks, Tile Adhesive and Grout, Industrial Grout, White Finish Cement Plaster and Thin Grey Cement Plaster with daily capacity of 150 tons.**

Autoclaved Aerated Concrete (AAC) History

Autoclaved Aerated Concrete roots go back to the 1920's, when Sweden was enduring an extreme shortage of wood due to deforestation. Desperately in need of an alternative building material, John Axel Eriksson developed the first Autoclave Aerated Concrete (AAC).

Later on about 45 years ago in West Germany, Josef Hebel a building contractor developed a more cost-effective building system by utilising mixers, moulds and cutting system and incorporated steel into the production for better strength. Architects and builders quickly saw the advantages of this strong yet lightweight material and were soon utilising its range of properties in all types of construction.

About AAC Blocks

Autoclaved Aerated Concrete Blocks are a solid, high performance concrete block that has been used for over 75 years in a variety of commercial, industrial and residential construction applications worldwide in different climates.

Autoclave Aerated Concrete Blocks are affordable, readily available, and can give perspective designers an edge in a very competitive market. Autoclaved Aerated Concrete Block meets architect', engineer', and contractor's concern for durability, quality of construction, building with energy saving products, as well as termite protection. Autoclaved Aerated Concrete systems are price competitive in comparison with other building materials and offer benefits that can reduce overall project costs considerably.

Raw Material Used

Raw materials used for production of Autoclaved Aerated Concrete Blocks are as follows :

- **Silica Sand**
- **Gypsum**
- **Cement**
- **Lime**
- **Aluminium Powder**

Note: The mix design is very much dependent on the density of the final product.

Production Process

Autoclaved Aerated Concrete Production begins with the crushing of the Silica Sand and Gypsum in a wet ball mill. The mix is stored in slurry tanks that are continuously mixed.

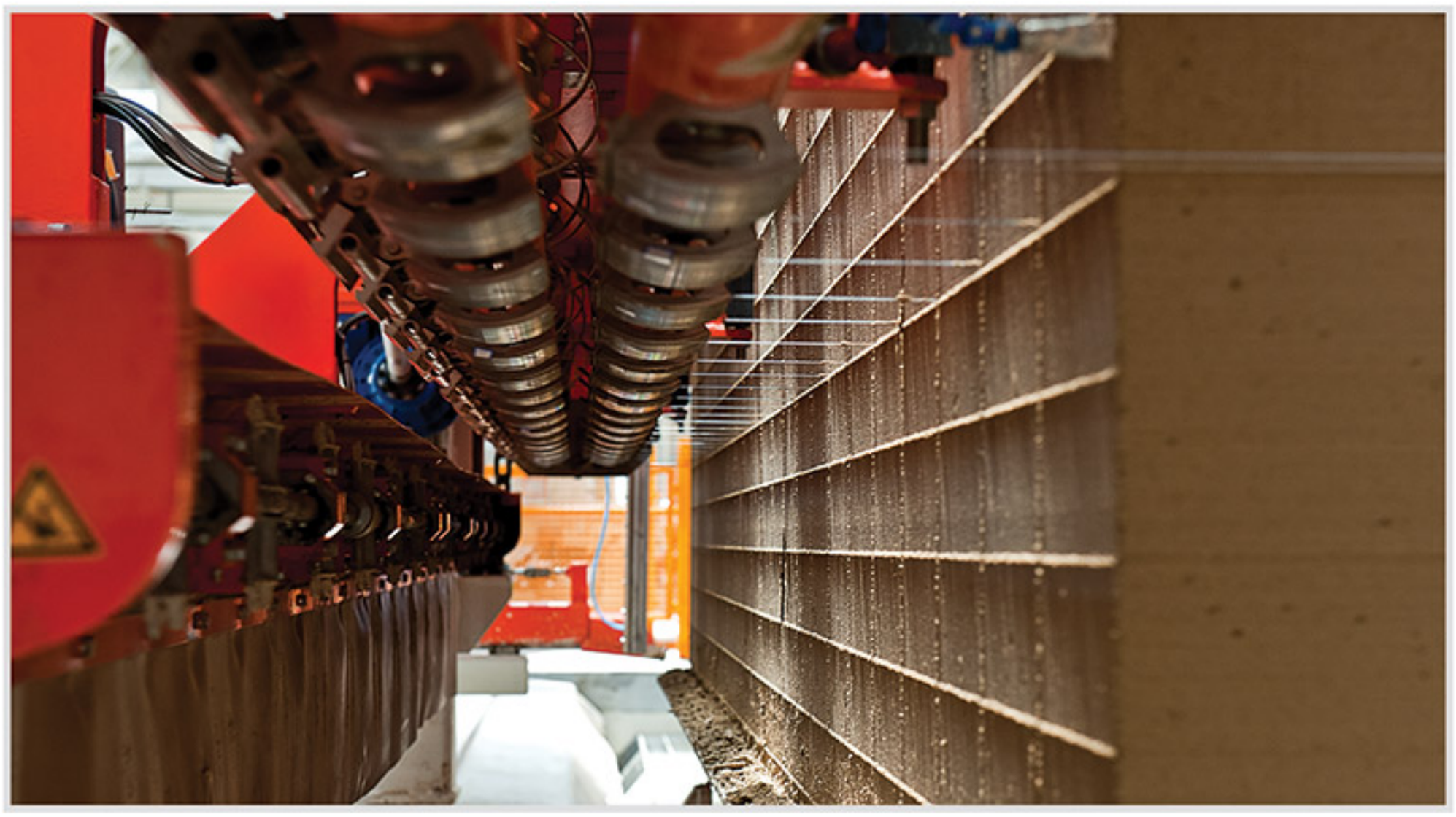
The density of the mix is controlled and adjusted with addition of fresh slurry when required.

Cement and lime that are kept in silos are accurately measured and added to slurry in the mixer; these are mixed to form new slurry. Also present in the mix is fine aluminium powder - this is added to produce the cellular structure. The density of the final product can vary by changing the amount of raw material in the mix.

The slurry is poured into moulds 6.16 m X 1.58 m X 0.69 m that resemble small railway wagons with drop-down side. The mould is then moved into a warm hall (rising area) for a period of several hours for setting and changing into a green cake. The setting time is dependent on the raw material quality and mix design.

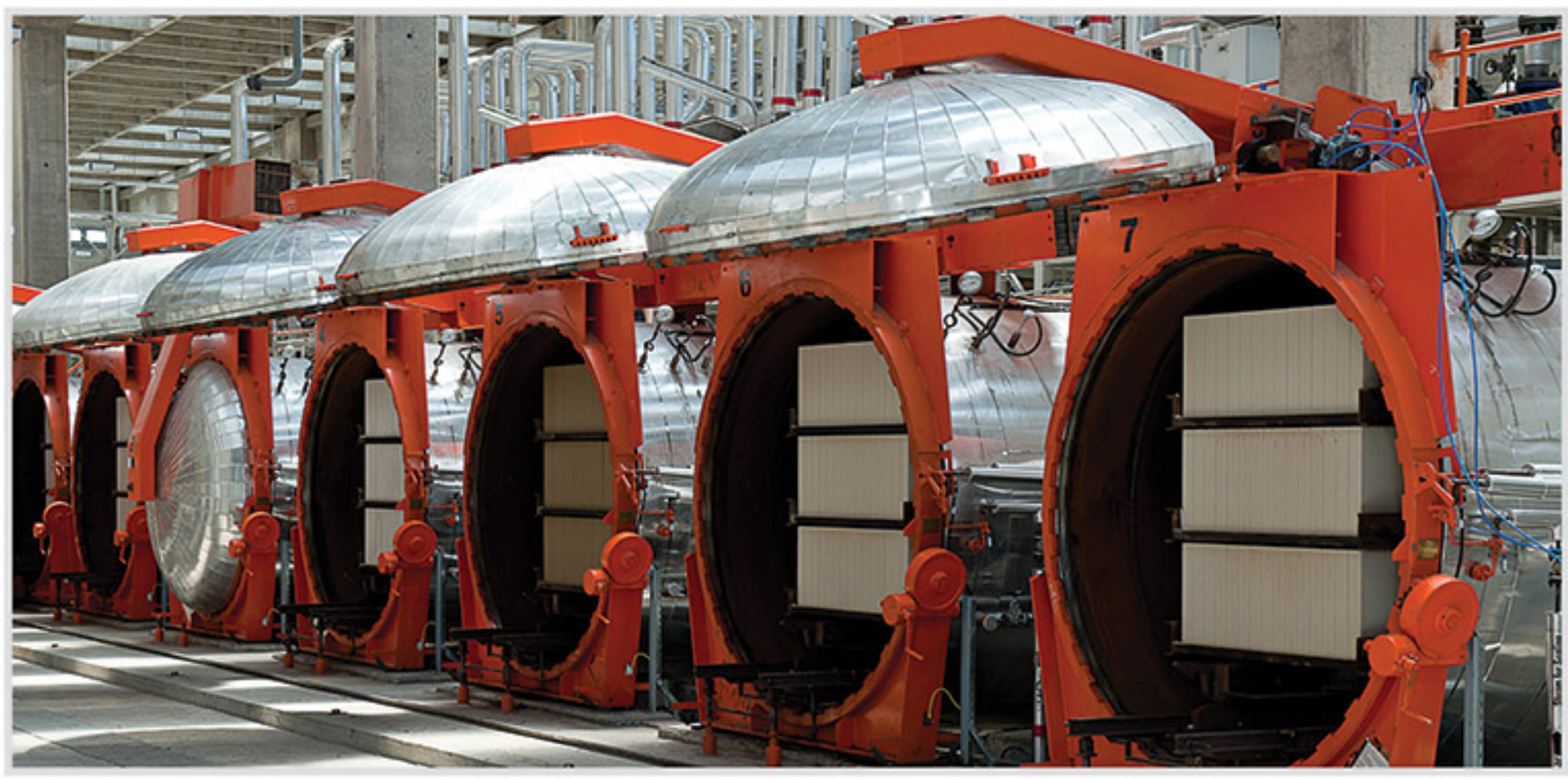
When the cake has risen to the required height, the mould moves along a track to where the cake is de-moulded entirely onto a trolley by a multi function manipulator (Tilting Manipulator) before the cake is cut into pre-set block size.

The cake is cut into desired and pre-set sizes by passing through a series of cutting wires. When required, during the cutting process tongs and grooves and also hand grips are added for ease of handling.



At the cutting stage, the blocks are still green - only a few hours have passed since the mix was poured into the mould and they are soft and easily glued. To insure separation after cutting, the cakes are passed through a state of the art machine “Green Separator” for separating each individual block from each other.

The separated blocks are then gathered and loaded into the autoclave. Parin Plant has seven autoclaves, 3 meter diameter and 50 meter long. These autoclaves have the capacity for producing 1550 m3 of autoclaved blocks per day. It takes a couple of hours for the autoclave to reach maximum temperature and pressure, which is held for a period of 12 hours, or longer for high density/high strength blocks.



After steaming is complete, the green cake is changed into a white product which signifies the crystallisation of hydro silicates. At this stage the pores structure of the product is clearly visible by the naked eyes as shown in the picture.

When removed from autoclave and cooled, the blocks have achieved their full strength and are packed, strapped, foiled and ready for transport.

Advantages Of Parin AAC Blocks

Lightweight, Yet Extremely Strong and Durable

Autoclaved Aerated Concrete (AAC) manufacturing process creates an ultra light concrete (about 1/5 the weight of conventional concrete) with a unique cellular structure. A structure, that doesn't require major repair and renovation for a very long time. Autoclaved Aerated Concrete has proven to be a very durable material despite of its lightweight. Its, solidity comes from the calcium silicate that encloses its millions of air pores and from process of curing in a pressurised steam chamber, an autoclave. Its excellent mechanical properties make it the construction material of choice for earthquake zones.

Autoclaved Aerated Concrete structures have been used in many different climates worldwide, many over sixty years old in excellent condition. Autoclaved Aerated Concrete systems can save money, inconvenience, energy and other resources too. Parin AAC Blocks will not rot, rust, corrode, or otherwise decompose.

High Thermal Insulation

Parin Block wall provides solid insulation, without the thermal bridging (cold spots) associated with through-wall framing members. Parin Aerated Concrete walls offer the advantages of minimising thermal bridges through the 'monolithic warmth-insulating' properties of this supportive construction material. At the same time, high compressive forces are tolerated since Aerated Concrete is glued with Parin Thin Joint Mortar. In combination with extra insulation techniques, the U-value achieved with these intrinsically insulating, supportive blocks is considerably better in comparison with traditionally masonry.

The Thermal efficiency of Parin Systems will also reduce the reliance on heating and cooling applications. The combined effects of running a heater less in winter and fan or air conditioning system less in summer can have a big impact on energy costs and the environment. In addition to greatly moderating the interior temperature, this allows energy consumption to be scheduled and shifted to off-peak hours, a benefit to power companies and home owners.

The warmth and moisture accumulating properties of the Autoclaved Aerated Concrete make a significant contribution to the occupants' sense of well-being. Thanks to the properties of Parin Products, the surface temperature of the walls remains optimal for a longer period.

Acoustic Insulation

Noise is a particular problem in modern living, for residents of homes and multi-residential building and for people working in commercial buildings. The solid wall construction of a building made of Parin Blocks provides exceptional acoustic insulation. It porous structure and high surface mass dampens mechanical vibration energy, greatly reduces outside noise pollution and indoor echo effect in empty rooms, providing a quieter, more comfortable interior for the occupants.
With sound insulation of Parin block walls, residents don't have to worry about bothering other members of their household or neighbours – and they needn't be annoyed by other people's noises.

Fire Resistance

Safe materials are better materials. Due to it purely mineral composition, Autoclaved Aerated Concrete is not only non-combustible, it has the highest level of fire safety among all other traditional building materials. Parin Autoclaved Aerated Concrete blocks can withstand a fire up to 1200 °C. A 10 cm think non-load bearing Wall, provides a U.L classified 4-hour fire rating. This far exceeds the requirements of the standard building code, and provides significant level of protection against loss of life and property.

Not surprising, Autoclaved Aerated Concrete's insulating properties are superior to other materials.

Simplified Construction

Parin Autoclaved Aerated Concrete unusual lightness greatly reduces the transportation costs required to deliver it to the job sites. Available as a pre-cast blocks in a variety of dimensions; Parin Autoclaved Aerated Concrete is engineered to precise standards at a state of the art facility located in Mashad. This ensures that when the materials arrive at job location, they require less manpower to install and less to clean up after installations as the dimensions are accurate.

Builders enjoy how easy Parin Autoclaved Aerated Concrete products are to work with. Parin Products can be cut and shaped using basic wood working tools such as saw, hammer, nails, etc.

Many types of fasteners, connectors and anchors can be used with Parin Products. The resulting ease of assembly saves both time and money over other traditional masonry products.

Green Building

Autoclave Aerated Concrete is well known as an environmentally friendly construction material. By choosing Parin Products you can feel good in the knowledge that you have chosen a building material that is better for our environment.

Parin Autoclaved Aerated Concrete product main ingredients are sand, lime and water that are both natural and are found abundantly in nature. The energy consumed in the production process is only a fraction compared to the production of other materials. The manufacturing of Parin products emits no pollutants and creates no by products or toxic waste.

Resistance to Freezing

AAC usually possesses good resistance to freezing, which is proved by un-rendered buildings, situated in areas where freeze/thaw cycles occur, remaining undamaged. This is caused by the introduced big spherical pores which are almost closed, which causes a very little capillary suction and therefore the moisture content does not normally reach the critical degree. When AAC is exposed to driving rain, melting snow or ground water, the critical degree of saturation caber reached. In such cases the AAC has to be protected with a coating.

Space and Style

As Parin Wall System is thinner than traditional masonry walls alternatives, they allow a greater internal living area for the same building dimensions and provide greater design flexibility. Parin Blocks walls can be coated with a variety of finishing materials to enhance its cosmetic appeals, its performance capabilities or both. Direct applications of breathable stucco or Parin Plaster, as well as other siding materials, are typical wall covering used.

What's more, Autoclaved Aerated structural strength paired with its ability to be shaped easily makes it a uniquely creative material. Parin block system is an amazing versatile building material, with a surface finish that gives you the opportunity to achieve your own creative effects with an infinite pallet of colours and texture combinations while maintaining its inherent performance advantages.

Mold Resistance

Concerns of mold growing in our homes and commercial buildings are at an all time high. Mold spores are everywhere but require certain conditions to multiply such as a warm temperature, sustained moisture, and organic nutrients. Certainly there are many remedies and preventative measures that can be taken to avert the growth of mold in a structure. One of these is the use of Parin Blocks in the construction of both exterior and interior walls.

As such Parin Block is not a food source for termite and when using on single skin block walls, it will not harbour other pests.

Impact Resistant

AAC blocks strength and porosity gives it greater resistance to impact damage and it will withstand any impact likely to occur under normal conditions.

Parin Beton AAC System Composition

Autoclaved Aerated Concrete Blocks

Parin Autoclaved Aerated Concrete blocks are manufactured in the following sizes as standard and also according to customer's need.

AAC Block Dimensions (cm)		
Length	Height	Width
60	25	7.5
60	25	10
60	25	12.5
60	25	15
60	25	17.5
60	25	20
60	25	25
60	25	30

Jumbo Blocks (cm)		
Length	Height	Width
60	50	10
60	50	12.5
60	50	15
60	50	17.5
60	50	20

Parin blocks from 15 Centimetre thickness and above come with tongue and grooves and have hand grips for ease of installation.

Thin Joint Mortar

Parin Beton Amood Supplies thin joint mortar, which is specifically, manufactured for use with Parin Beton Autoclaved Aerated Concrete products. It comes in ready-to-mix powder form in 25 Kg bags. Just 1–2 mm of mortar bed is needed to bond the products. This extremely thin joint prevents heat loss and speed installation. For the best result, apply the thin mortar using a mortar sledge or a notched trowel with the same width as the block. This method gives a straight and smooth wall surface suitable as such for coating or for tiling.

Autoclaved Aerated Concrete Thin Joint Mortar is designed for both hot and dry climates and for moderate climates. A minimum temperature of +10 C is recommended. If the temperature of the masonry units is 0 C...+10 C the use of warm water for the mixing of the mortar is recommended.

Proposed Installation Method

Storage

As can be observed from the picture, Parin blocks are packaged on 1.20 m X 1.0 m palates at the factory for maximum protection. The following are recommended :

- Order only the amount of material that can readily be installed.
- Unload pallets using pallet forks either forklift or pallet fork mounted on a crane. For safety reasons it is not advisable to use crane strap or slings.
- Storage should be easily accessible to truck or lift truck at all time.
- If possible, drop-deliver the product right to material staging areas.
- Storage area should always be away from other construction activities and on a flat-graded area that is not susceptible to standing water, erosion or settling to avoid damages to products.
- Always keep the product covered and banded until ready for installation.

Tools Needed

- **Spirit Level**
- **Agitator (Mixer)**
- **Carpenter Saw**
- **Trowel**
- **Notched Trowel**
- **Rubber Hammer**
- **Brush**

Work Method

The first layer must be horizontal and it is laid on a bed of ordinary mortar. If the surface is uneven a general purpose masonry mortar is used. The grouting grooves in the butt ends of the blocks are filled with AAC Thin Joint Compound. After the hardening of the first layer the work is continued with AAC Thin Joint Compound using a mortar sledge or a notched trowel with notches e.g. 6 x 6 x 9 mm. The grouting grooves in the butt ends of the blocks are filled with AAC Thin Joint Compound. The units are laid in overlapping bond pattern. The width of the joint is determined by the notches of the mortar sledge or the notched trowel and is normally 2 - 4 mm. If the blocks are very dry, and if the conditions are very hot, they are moistened prior to the masonry work. The grouting grooves are filled with AAC Thin Joint Compound.

Wall ties and lintels are used according to the instructions by the designer for inclusion of reinforcement. Reinforcement grooves are moistened and filled with AAC Thin Joint Compound so that they are completely covered with mortar. Use spirit level and mason´s line to ensure that the units are laid straight and plumb. The AAC Thin Joint Compound has a certain open time during which the position of the unit can be adjusted e.g. with a rubber hammer.

Excess mortar, squeezed out from the joints, is immediately removed as the work proceeds and the wall surface is cleaned with a masonry brush after the mortar has dried but before it has initially set. Excess hardened mortar on the wall surface will disturb tiling or coating of the wall. For the filling of the grooves for plumbing and electrical wiring, general purpose masonry mortar is used.

Curing

Parin Thin Joint Mortar needs no water curing.

Parin Autoclaved Aerated Concrete Block Standards

Standard's

Test or Report	Description
ASTM C 1386 Standard Specification AAC Units	Standard Covers Physical Requirements of Load-bearing Compression and Non-Load-bearing AAC Units
ASTM C 1555-03 Standard Practice for Autoclaved Aerated Concrete Masonry 1	Standard covers workmanship of AAC, thin bed mortars, and exterior and interior finishes.
ASTM E 119 Fire Test of Building Constructions and Materials	Fire Test of Wall Assemblies (Load and Non-Load-bearing) and Hose Stream Test. Fire Test of Floor and Roof Assembly
ASTM E 90-97, E 413-87 and C 423-99a Sound Transmission Loss Test (STC)	Airborne Sound Transmission Test on Walls
ASTM C-469 Modulus of Elasticity	Stress Strain Curve of AAC in Compression
ASTM E-78 Flexural Strength	Flexural Test of AAC Units To Determine Flexural Strength
ASTM E-518 Flexural Bond Strength of Masonry	Assembly of Masonry Units Constructed as Beams
ASTM E-519 Diagonal Tension Test of Masonry Assemblies	Full Scale AAC Walls To Determine Shear Strength
ASTM C-177-85 Standard Test Method for Steady-State Heat Flux Measurements and Thermal Transmission Properties by Means of the Guarded Hot Plate Apparatus	A Portion of AAC Material of 12 x 12 inch and 1 inch Thick is Placed in the Guarded Hot Plate. It Is Subjected to a Heat Source and Temperature Measurements are Made Until a Steady State is Reached. This test is used to determine experimental value as thermal conductivity (K) on AAC units.
ASTM E-514 Test for Water Penetration and Leakage Through Masonry	Full Scale Wall Assemblies Subjected to Water Under Pressure Exposure.

Parin Beton Amood Quality Control and Assurance

Quality Control Procedure

All materials used in production process have to be examined, tested, scrutinised and certified before used in Parin Beton Amood's production cycles. Therefore, all raw materials and products are routinely tested on daily basis.

Quality Assurance team daily examine and test all raw materials and products for compliance with the Parin's quality standard before allowing into production cycles or packaging. Raw materials tested are lime, cement, gypsum and silica sand. Slurry is also a raw material that is produced in the plant during the production and tested regularly for compliance with standards.

In general, there are two types of tests that are regularly performed.

A) Raw material tests

B) Final Products tests

Raw Material Tests

- **Lime Tests: Particle Size Distribution, Finesse, Reactivity, Chemical Analysis and LOI.**
- **Silica Sand: Particle Size Distribution, Finesse, Chemical Analysis and Humidity.**
- **Cement: Blain Size and Vicat Test.**
- **Gypsum: Particle Size Distribution, Finesse and LOI.**
- **Slurry: Particle Size Distribution, Density, PH and SO3 content.**

Test Methods

Raw Material Tests

Particle Size Distribution is very important in production of Autoclaved Aerated Concrete products. Like chemical reaction, particle size has a major influence on the quality of final products. Therefore, all raw materials and slurries used are tested for particle size distribution and finesses. In case of non-compliance materials are rejected. The particle size distributions are performed by sieves 0.09, 0.125, 0.25, 0.5, 1, 2, 3.15 and 4 mm (Picture 4) and other powdered materials with sieve air jet (Picture 2). In this apparatus sieves 45, 63 and 90 microns are used.

Lime Reactivity

Lime reactivity influences chemical reaction in the cake. Lime reacts with water; hydrate and generates heat. The reactivity of lime is measured according to European standards with the apparatus shown in Picture 4.

Vicat Test

The setting time of the cake is directly dependent on the initial and final setting time of the cement used in production. Therefore, Initial and Final Setting time of the cement is measured with the Vicat apparatus shown in Picture 3.

SO3 content in Slurry and LOI

The content of SO3 in slurry indicates the amount of gypsum in slurry which has direct effect on the quality of the final product. LOI content is indicative of the lime quality.

Slurry Density

The density of slurry is continuously controlled for adjustment of cake slurry mix and product quality.

Lime Chemical Analysis

CaO content of lime is measured using titration with chloridric acid. The Cao content provide accurate information regarding the suitability of lime for AAC production.

Product Related Tests

Parin Beton Amood Autoclaved Aerated Concrete products are manufactured according to EN-771 and as such all products are tested for the following parameters:

1- Dry Density Measurement (Kg/m3).
2- Compressive Strength (N/mm2).
3- Dimension Control
4- Shrinkage
5- Thermal Conductivity
6- Freeze and Thaw resistance

Thermal Conductivity and Freeze and Thaw resistance tests are outsourced regularly.

Laboratory Equipments

Picture No. 1
Name: Shaker
Manufacturer: Retsch AS200 (Germany)
Range: 0.09, 0.125, 0.250, 0.500, 1.2, 3.15 and 4 mm.

Picture No.2
Name: Air Jet Shaker
Manufacturer: SLS 200 Sibtechnik (Germany)
Range: 45, 63 and 90 Micron

Picture No. 3
Name: Vicat, Cement Setting Time Measurement
Manufacturer: Test + Form (Germany)

Laboratory Equipments

Picture No. 4
Name: Reactivity Apparatus
Manufacturer: IKA RW 20

Picture No. 5
Name: Weighing Scale
Manufacturer: Kerm (Germany)
Maximum: 2000 and 6000 g
Accuracy: 0.1 g

Picture No. 6
Name: Weighing Scale
Manufacturer: Kerm (Germany)
Maximum: 220 g

Picture No. 7
Name: Weighing Scale
Manufacturer: Kerm
Maximum: 60 Kg
Accuracy: 2g

Picture No. 8
Name: Distil Water Apparatus
Manufacturer: Behropur (Germany)

Laboratory Equipments

Picture No. 9
Name: Microwave
Manufacturer: Panasonic

Picture No. 10
Name: Laboratory Refrigerator
Manufacturer: Liebherr (Austria)

Picture No. 11
Name: Laboratory Freezer
Manufacturer: Liebherr (Austria)

Picture No. 12
Name: Oven
Manufacturer: Memmert (Germany)
Maximum Temperature: 250 degree Celsius

Picture No. 13
Name: Oven
Manufacturer: Nabertherm (Germany)
Maximum Temperature: 3000 degree Celsius

Laboratory Equipments

Picture No. 14
Name: Ultrasonic Cleaner
Manufacturer: Bandelin Sonorex (Germany)

Picture No. 15
Name: Compressive Strength Jack
Manufacturer: Test + Form (Germany)
Maximum Axial Load: 200 KN

Picture No. 16
Name: Band Saw
Manufacturer: Lissmac (Germany)

Picture No. 17
Name: Polisher
Manufacturer: Rohm 201 (Germany)
Maximum Dimensions: 10 X 10 X 10

Picture No. 18
Name: Digital Vernier Caliper
Manufacturer: Mitutoyo (Japan)
Maximum Range: 300 mm
Accuracy: 0.001 mm

Laboratory Equipments

Picture No. 19

Name: Vernier Caliper

Manufacturer: Holex (Germany)

Maximum range: 700 mm

Accuracy: 0.01 mm

Efficiency Comparison Between Parin AAC and Traditional Masonry

Thermal Efficiency

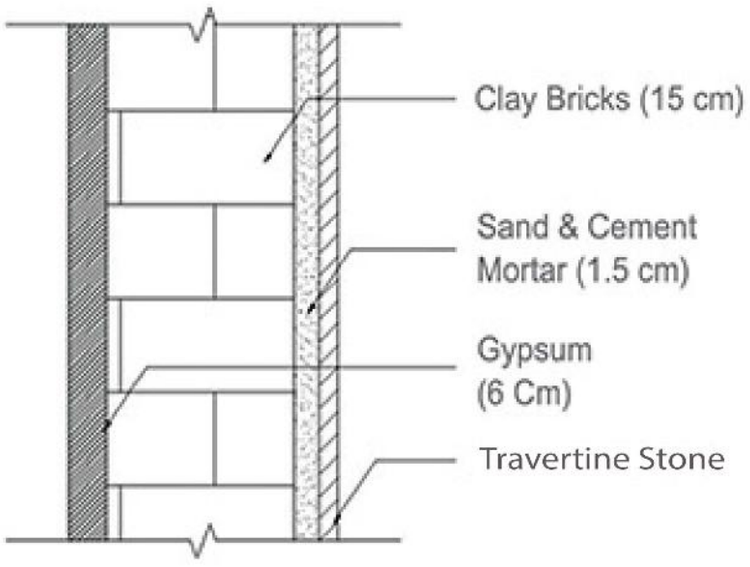
Introduction

In order to evaluate the efficiency of the Parin Blocks two identical domestic houses in which the only difference was the type of material used for walls were compared.

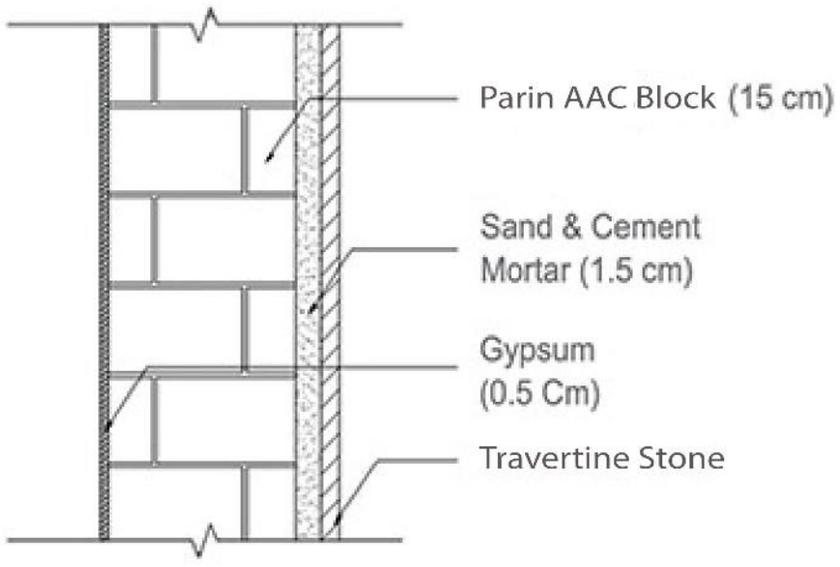
Unit number one (P), constructed with Parin blocks with 150 mm thick walls for parameter and internal partitions. Second unit (O), constructed with traditional masonry (clay hollow bricks) with the same thickness.

Assumptions:

1- Location of the buildings : Mashad, Iran
2- These units are situated in middle sections of tower blocks.
3- The floor area is assumed to be 98 m2
4- External wall details for the respective walls are as shown below:



Unit O



Unit P

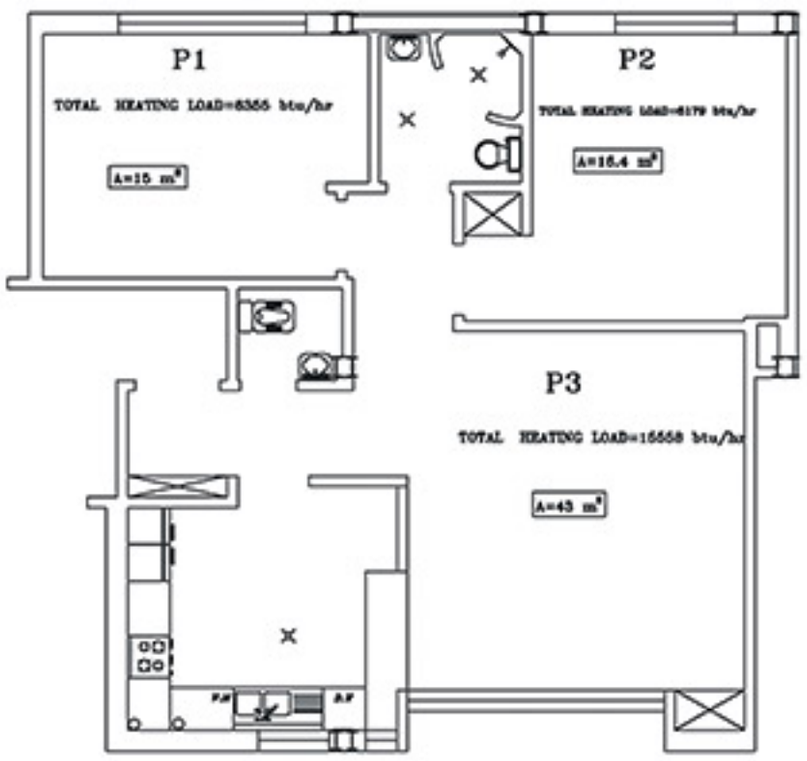
Note: In Parin Unit because of smooth surface of the blocks a layer of gypsum is eliminated and maximum finishing layer of gypsum is considered to be 4 – 5 mm.

5- All calculations are done with the Carrier software.

6- All windows are UPVC double glazed.

7- In both units the ventilation is assumed to be 0.25 cfm.ft2

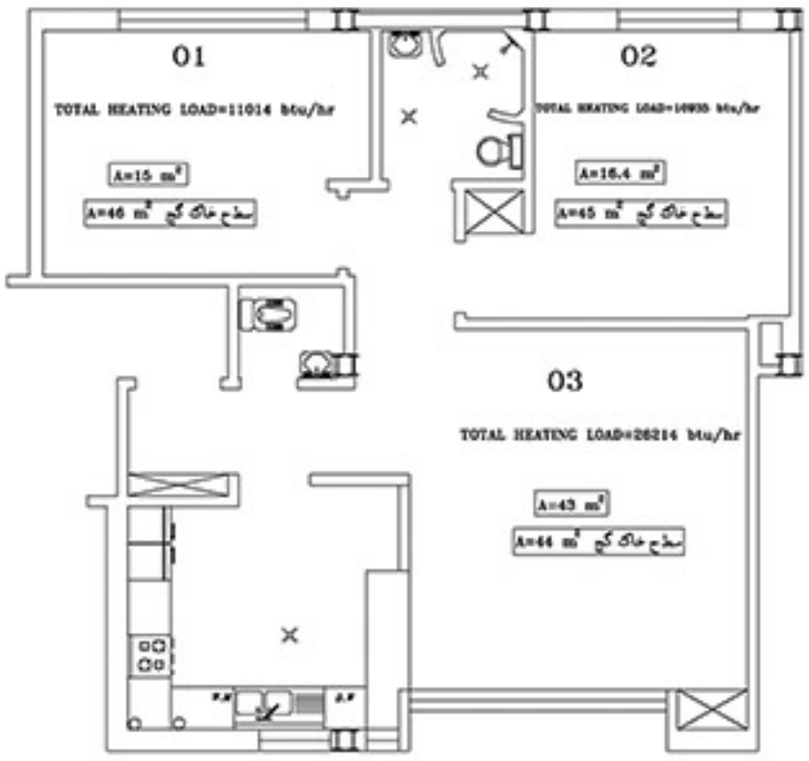
Unit O Calculation



A:98 m²
MATERIAL :
U= 0.107 w/m².k
K= 2.33 w/m.k
K= 0.53 w/m.k
K= 0.14 w/m.k
K= 0.5 w/m.k
U= 0.029 w/m².k
U= 0.7622 w/m².k = 0.134 btu/hr.ft².F

① TOTAL HEATING LOAD=28092 btu/hr=7023 Kcal/hr

Unit P Calculation



A:98 m²
MATERIAL :
U= 0.107 w/m².k
K= 2.33 w/m.k
K= 0.53 w/m.k
K= 1 w/m.k
K= 0.5 w/m.k
U= 0.029 w/m².k
U= 2.222 w/m².k = 0.392 btu/hr.ft².F

② TOTAL HEATING LOAD=48163 btu/hr=12040 Kcal/hr

Conclusion

Total Comfort with Parin AAC Block

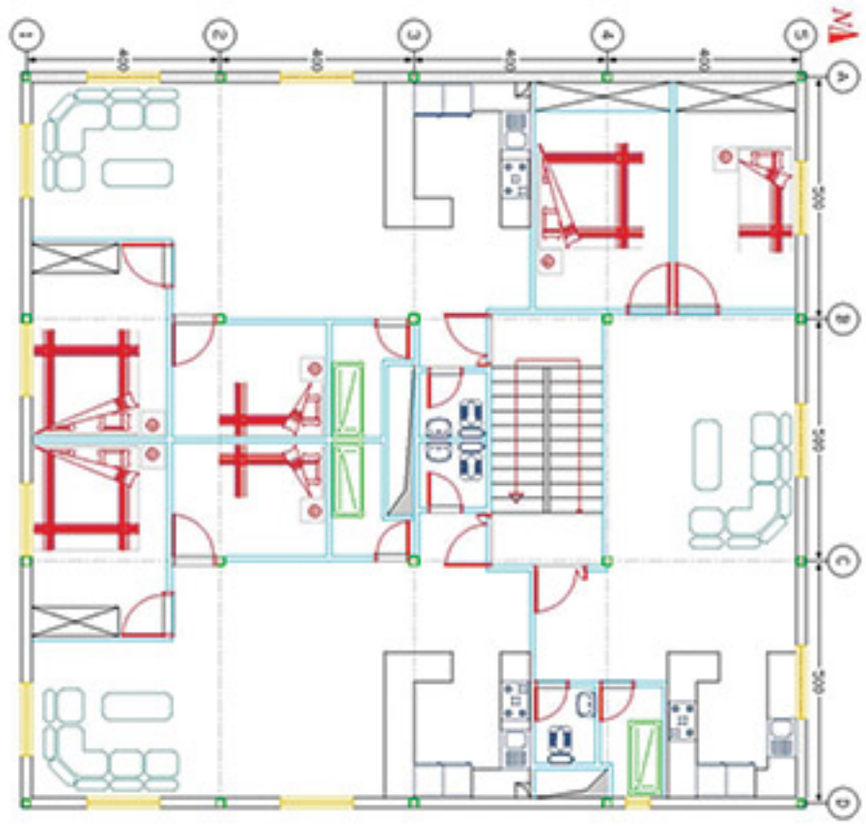
As it can be seen from the calculation amount of heat required to warm Parin home is 28092 btu/hr in comparison with that of traditional clay brick home of 48163 btu/hr. This difference means to warm the same area you have to use about 71.44% more energy and consequently just as much more (71.44%) cost.

Load Efficiency

Assumptions:

The buildings have the following criteria:

a) Building is 4 storeys high and has floor area 15 m X 16 m.
b) Building is a steel structure framed
c) Building is residential and has the layout :



In table below details of load distribution for each building are shown and then comparisons between the two types are evaluated :

Parameter Walls Load Distributions — **36% Reduction Percentage**

Loading Details						
	Clay Brick			AAC		
Parameter Wall	Thickness (m)	Density kg/m³	Weight kg/m²	Thickness (m)	Density kg/m³	Weight kg/m²
Travertine Stone	0.02	2400	48	0.02	2400	48
Mortar	0.025	2100	52.5	0.025	2100	52.5
Wall Block	0.2	850	170	0.2	500	100
Gypsum & Clay	0.025	1600	40	0	1600	0
White Gypsum	0.01	1300	13	0.005	1300	6.5
Sum.			**324**			**207**

Internal Partition Walls Load Distributions — **53% Reduction Percentage**

	Clay Brick			AAC		
Internal Partitions	Thk. m	Density kg/m³	Weight kg/m²	Thk. m	Density kg/m³	Weight kg/m²
Wall Block	0.1	850	85	0.1	500	50
Gypsum & Clay	0.05	1600	80	0	1600	0
White Gypsum	0.02	1300	26	0.02	1300	26
Sum.			*191*			*76*
Partition	1.11	factor	**212**	1.11	factor	**84**

Minimum 100 Kg/m2

Floor Load Distributions

28% Reduction Percentage

Floor Dead Load	Clay Brick			AAC		
	Thickness (m)	Density kg/m³	Weight kg/m²	Thickness (m)	Density kg/m³	Weight kg/m²
Ceramic	0.009	2100	18.9	0.009	2100	18.9
Mortar	0.03	2100	63	0.03	2100	63
Grading	0.06	600	36	0.06	600	36
False ceiling			50			50
Mechanical			20			20
Partition			212			100
Sum.			***400***			***288***

Forces Distributions

	Clay Brick		AAC		Percentage Reduction
Max. Bracing Force	17.4	Ton	16.2	Ton	7%
Bracing Profile	2UNP16		2UNP14		
Max. Column Force	61.2	Ton	46.6	Ton	24%
Column Profile	2IPE18		2IPE16		
Max. Beam Moment	7.26	T.m	5.53	T.m	24%

With respect to the light weight of Parin AAC blocks the distribution of forces for different elements within building steel structure are evaluated in comparison with the traditional masonry.

It is very apparent with the reduction of loads due to light weight of Parin AAC blocks dimensions of columns, beams, etc are reduced and consequently foundation size is also reduced. These reductions ultimately save money and energy and increases with the building height.

PARIN BETON

No. 29, 16th Samanieh St.,
Vakil Abad Blvd, Mashad, IRAN.
Postal Code : 91786 53978

Tel. : (+98 511) 8838390

www.parinbeton.com
info@parinbeton.com