Production and Trading Group

SUN BETON

Specialized in the production and supply of lightweight autoclaved blocks:

Teblex – Hebelux – Formstone – AAC

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Production process

Raw materials

The structure of lightweight AAC concrete is composed of the following raw materials:

Silica | Cement | Lime | Gypsum | Aluminum powder

Description of the production process

1- Grinding silica and gypsum with water to prepare a slurry.

2- Mixing cement, lime, and slurry in a mixer according to a specified formula for a set period of time.

3- Adding aluminum powder to produce the green cake.

4- Molding the cake and transferring the molds to the curing hall.

5- After sufficient moisture reduction, the cake is moved to the cutting line and cut into desired sizes using special wires. After this step, the cake is ready for the curing process.

Production process explanation

The green cake prepared for curing under specific pressure and temperature is first arranged and automatically loaded into the autoclave. Once the autoclave door is closed, the curing process begins, controlled by the software system.

1. Time before applying steam and pressure

2. Gradual application of steam and controlled increase of pressure

3. Application of constant steam and pressure

4. Gradual reduction of pressure

The Teblex company production line has 8 autoclaves with a diameter of 2.90 meters and a length of 43.70 meters.

These machines have the capacity to cure 1،555 cubic meters of AAC concrete per day.

Technical specifications of the blocks

Teblex lightweight blocks are produced in two strength classes according to the Iranian national standard, with the specifications shown in the table below, and are used in non–load–bearing walls.

Strength class	Density range IB/ft³ (Kg/m³)	Dry bulk density IB/ft³ (Kg/m³)	Compressive strength IB/in² (MPa)
AAC 2.0	22(350) 28(450) 28(450) 34(550)	25(400) 31(500)	290(2.0)
AAC 4.0	28(450) 34(550) 34(550) 41(650)	31(500) 37(600)	580(4.0)

Block technical specifications

Row	Product	Block dimensions (cm)	Pallet capacity (m^3)	Blocks per m^3	Block weight (typical moisture) 20%	Dry block weight (kg)	Quantity per pallet (No)	Pallet capacity (m^2)
1	AAC block	60x25x7.5	1.8	89	6.9	5.74	160	24
2	AAC block	60x25x10	1.8	67	9.2	7.65	120	18
3	AAC block	60x25x12.5	1.8	53	11.5	9.56	96	14.4
4	AAC block	60x25x15	1.8	44	13.8	11.5	80	12
5	AAC block	60x25x17.5	1.8	38	16	13.4	69	10.35
6	AAC block	60x25x20	1.92	33	18.36	15.3	64	9.6
7	AAC block	60x25x25	1.8	27	22.95	19.1	48	7.2
8	AAC block	60x25x30	1.8	22	27.55	22.95	40	6

Technical advantages of the blocks

- Waterproof and frost–resistant insulation
- Increased interior space of the building
- Durable with no need for repairs
- Cost savings (transportation and installation)
- No possibility of pest intrusion
- Customizable production
- Lightweight and strong
- Fire–resistant
- Acoustic insulation
- Thermal insulation (energy saving)
- Speed and ease of installation
- Environmentally friendly

Lightweight and strong

Lightweight construction is one of the main concerns in earthquake-prone countries like Iran. Using Teblex blocks for lightweight construction reduces the building frame weight by 30% and also decreases the mortar consumption during installation by 25%. This not only lessens the destructive forces of earthquakes but also reduces costs by approximately 30%.

The reason for this product's lightness is its porous structure formed within the concrete, which preserves about 80% of the air within the initial mortar and lowers the density to less than 500 kilograms per cubic meter.

Materials / Thickness	AAC	Clay block	Brick
10 cm	80	160	260
20 cm	160	250	450
30 cm	240	335	635

Comparison table of the weight of different walls (kg/m^2)

Fire-resistant

Fire resistance is expressed based on the number of hours materials can withstand a standard fire، and it is referred to as the fire rating (UL). This is one of the strictest existing building standards.

Teblex blocks demonstrate good fire performance، mainly due to their high resistance to heat transfer resulting from the use of non-combustible raw materials. One of the main raw materials used is silica، which significantly raises the material's heat tolerance and acts as an insulator against heat. The heat transfer rate in this type of block is approximately 3 centimeters per hour.

Teblex blocks not only have higher fire resistance compared to other materials، but they also do not produce harmful gases and can withstand extreme temperatures up to 1200°C. They hold the highest UL rating among building products.

Thickness	7.5 cm	10 cm	15 cm
Fire resistance	3 hours	4 hours	5 hours

Fire resistance table of AAC walls

Acoustic Insulation

Noise pollution in modern life and large cities has disrupted human comfort.
Therefore, construction materials should be used that help reduce noise pollution in office buildings, educational, healthcare, residential, and recreational centers.
Controlling unwanted noise in buildings greatly impacts the health and peace of residents.
AAC blocks, due to their molecular structure and the way their pores are distributed, are highly sound-absorbent. According to ASTM standards, they can reduce noise intensity by up to ۵۰ decibels and are classified as very good insulators

Thickness	10 cm	15 cm	20 cm
Fire resistance	39db	44db	50db
Type of acoustic insulation	Good to very good	Very good	Great

Sound absorption table of AAC blocks with different thicknesses

Advantages of Thermal Insulation for Buildings

- Energy saving and cost reduction
- Creating comfortable thermal conditions inside the building even in extremely hot or cold weather
- Protecting the building from environmental and weather changes
- Reducing energy consumption, which not only saves costs but also decreases atmospheric emissions and helps mitigate global warming
- Reducing the size and capacity of heating and cooling equipment by up to 50%

Energy saving

Thermal insulators include materials that effectively reduce the transfer of heat and cold from one environment to another. In buildings, they are more important in exterior walls that are directly exposed to outside air than in interior partitions.

Teblex blocks, due to having numerous air-filled cells, provide good thermal insulation. The thermal conductivity of this type of concrete is about 10% that of ordinary concrete. Additionally, the thermal resistance of a wall made with this product is approximately three times greater than that of similar walls made from clay blocks.

Rapid construction

Due to their lightweight nature, ease and precision of connection between blocks, and the elimination of certain tasks such as initial wall plastering, the construction speed using this method can increase up to three times.

Teblex blocks can be easily cut, adjusted, and shaped. Screws and nails can be easily inserted into them, and they allow the creation of very narrow channels for electrical conduits and plumbing.
This flexibility enables easy installation, design, construction, and adjustments in all areas of building, making it a significant advantage.

Materials / Thickness	AAC	Clay block	Brick
10 cm	40	30	15
20 cm	25	20	10
30 cm	20	-	5

Comparison table of the construction rates of different types of walls in square meters by a work team in one working day

Environmentally Friendly

- **Avoidance of Clay Use in Product Manufacturing:**
  Since clay is more suitable for agricultural purposes such as gardens and farmlands, avoiding its use in this product helps prevent excessive soil degradation and improper consumption.
- **No Construction Waste Generation:**
  The use of other traditional materials often creates a significant amount of construction debris, which not only leads to wasted time and money but also harms the environment.
- **Reduction of Air Pollution:**
  Due to the product's high thermal resistance, it reduces the need for fuel consumption for heating and cooling, which in turn significantly helps in reducing air pollution.
- **Recyclability:**
  Waste materials from certain industries can be recycled and used as raw materials in the production of this product.
- **Non-Perishability:**
  Thanks to the components used in these blocks, the product does not decay and has a long shelf life. Being made from inorganic materials, it does not undergo any chemical or structural changes, does not develop mold, and does not provide a suitable environment for microorganisms. As a result, insects like ants, cockroaches, and others do not nest or lay eggs in it.