



TBLEX





TBLEX Autoclaved Aerated Concrete (AAC)
Blocks & Reinforced Panels + Dry Mortar Iran Kaolin
Industries Company (Public Joint Stock Company)

TBLEX

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About Iran Kaolin Industries Company (Public Joint Stock Company)

Iran Kaolin Industries Company (Public Joint Stock Company), the largest and most experienced producer of various types of processed kaolin in the Middle East and Iran, was established in 1985 in Marand, East Azerbaijan Province. Its processing plant became operational in 1993, and in 1996, the company was listed on the .Tehran Stock Exchange

In line with completing the product value chain and utilizing the silica obtained from processed kaolin production, the company has included the production of Autoclaved Aerated Concrete (AAC) blocks and panels, as well as dry mortar, in its development plan. We are proud to operate as the largest and most modern AAC production facility, offering our products with an annual capacity of 325,500 cubic meters of various blocks, 139,500 cubic meters of reinforced and non-reinforced panels, and 48,000 tons of dry mortar. All production is carried out using the latest global technologies (HESS, FIRICH, LAHTIPRECISION), tailored to meet the demands of both domestic and international markets



TBLEX – Autoclaved Aerated Concrete (AAC) Products and Dry Mortar

Autoclaved Aerated Concrete (AAC) was first invented and produced in the 1920s by Dr. Johan Axel Eriksson, an assistant professor at the Stockholm Institute of Technology in Sweden. The motivation behind its development was to protect forests and create a building material with wood-like properties, such as light weight, thermal insulation, and ease of cutting and shaping, while avoiding the disadvantages of wood, including flammability, decay, and termite damage.

In 1945, German innovators discovered the method of precise cutting for AAC, which enabled its mass production. By 1958, it received approval and standardization under the German DIN standards. From 1960 onwards, due to the cost-effectiveness of construction using this material, German scientists focused on improving its structural strength. In 1977, the material was refined with male and female joints and precise cuts, minimizing construction challenges.

Since 1987, the production of large AAC components revolutionized construction, significantly reducing building time. By 1994, through extensive research and development, the strength and lightness of the product reached their peak performance.

Today, AAC is produced in many countries under various brand names. While these products may differ in raw material ratios, cutting techniques, and production processes, they all share the core advantages of AAC as a high-performance, lightweight, and durable building material.

Autoclaved Aerated Concrete (AAC) TBLEX Process



**AUTOCLAVED
AERATED
CONCRETE**

AAC TBLEX PROCESS



TBLEX Production Process Raw Materials

The structure of Autoclaved Aerated Concrete (AAC) is composed of the following raw materials

- ▶ Silica
- ▶ Cement
- ▶ Lime
- ▶ Gypsum
- ▶ Aluminum Powder





► *Production Process Description*

- Milling of silica and gypsum with water to prepare a slurry .
- Mixing of cement, lime, slurry, and aluminum powder according to a specific formula in a mixer for a defined period to produce a green cake .
- Molding the cake and transferring the mold to the pre-curing (pre-conditioning) hall .
- After sufficient moisture reduction, the cake is transferred to the cutting line and cut into desired dimensions using special wires. After this stage, the cake is ready for the autoclaving process .
- Post-autoclave curing: Curing of products after autoclaving continues either through storage in the yard or through on-site installation in the project, and the compressive strength of the products increases, such that 28 days after autoclaving, laboratory tests show a minimum 20% increase in compressive strength .
The prepared green cake, for curing under specified pressure and temperature, is automatically loaded into the autoclave after stacking. Upon closing the autoclave door, the curing process is initiated by a software system .
The time and curing cycle of AAC (Autoclaved Aerated Concrete) in the autoclave and afterward can be briefly divided into four stages :
 - Vacuum before applying steam and pressure to the autoclave
 - Gradual application of steam and controlled pressure increase
 - Constant pressure and steam application (holding phase)
 - Gradual pressure reduction (depressurization)
- The production line of the (TBLEX / Hebel plant) has 8 autoclaves; the autoclaving capacity of these units is 1550 cubic meters per day .
Upon completion of autoclaving, the green cake transforms into an almost white cake, indicating that the process is complete .



- The white cake discharged from the autoclave is transferred by a robot to the packaging line, and after being strapped by a machine, it is wrapped with plastic packaging .

For the production of reinforced panels (wall or ceiling panels), reinforcement bars (rebar) that have been prepared in advance and coated with a special anti-corrosion adhesive are placed inside the molds. Then the slurry is poured into the mold and around the rebars. After the mold is filled and the slurry rises, the resulting cake is cut to the required dimensions.

Differences among various types of AAC concrete in terms of specific density and other properties arise from changes in the ratio of constituent materials and the desired chemical compositions used in their production .

The production of special blocks in various shapes, such as tongue-and-groove blocks or blocks with a very smooth surface, etc., is also possible depending on the equipment of the TBLex plant.





TBLEX

Laboratory and Quality Control Department

▶ TBLEX – Laboratory and Quality Control Department

The TBLEX Laboratory and Quality Control Department is equipped with the most modern and precise laboratory instruments. Given the critical importance of final product quality, continuous supervision is conducted at all stages of production. This includes

- Inspection of incoming raw materials to authorize entry into production lines

- Monitoring of intermediate production parameters

- Supervision of equipment and machinery performance

- Final product testing to ensure compliance with both international standards and Iranian national standards

By maintaining strict quality control throughout the entire manufacturing process, TBLEX ensures the highest level of reliability, consistency, and performance in all its products





Packaging

► Packaging

TBLEX blocks are automatically placed on wooden pallets and packaged using UV-resistant shrink wrap before being delivered to customers





Precision and Craftsmanship with TBLEX



Technical Specifications of TBLEX Blocks

TBLEX lightweight blocks are manufactured in two strength classes, in accordance with the Iranian National Standard

They are used in load-bearing and non-load-bearing walls based on the specifications shown in the table below

Table: Specifications

Strength Class	Compressive Strength (N/mm ²)		Bulk Density Range (kg/m ³)	Maximum Average Drying Shrinkage (%)
	Minimum	Average		
Class B.H. 2-1	Minimum: 2	Average: 2.5	350–450	0.02
			450–550	
Class B.H. 4-1	Minimum: 4	Average: 5	450–550	
			550–650	
			650–750	
			750–850	

TBLEX Ceiling Blocks

TBLEX ceiling blocks are one of the newest and most advanced materials for construction and ceiling systems. They have numerous advantages; therefore, many engineers prefer them for building ceilings, and they are highly popular among contractors. TBLEX ceiling blocks are an excellent replacement for polystyrene (Styrofoam) and clay roof blocks, and are widely used in the construction industry. They are manufactured in specific standard dimensions according to their application in buildings.

Key Advantages

- ▶ Sound and thermal insulation
- ▶ Solid structure – eliminating impact noise
- ▶ Fire-resistant — eliminating the need for plaster layers and metal mesh
- ▶ Resistant to earthquakes and moisture
- ▶ Reduction of dead load in structures
- ▶ Competitive price and proper packaging

TBLEX ceiling blocks are manufactured and packaged according to the following dimensions and specifications

Ceiling Block Specifications

Product Name	Block Dimensions (cm)	Thickness (cm)	Volume per Pallet (m ³)	Area per Pallet (m ²)	Quantity per Pallet	Dry Weight per Block (kg)	Block Width on Beam (cm)
Ceiling Block	60×25×20	20	1.92	9.6	64	10.4	3.5
Ceiling Block	50×25×25	25	1.8	7.2	48	13	3.5



Ceiling Blocks



Ceiling Blocks

TBLEX Reinforced Panel

▶ TBLEX Reinforced Panel

The panels made from autoclaved aerated concrete (AAC) are produced in a reinforced form using a steel rebar mesh to resist the loads applied to them and are delivered to users. The amount of this reinforcement and the related calculations are performed based on valid standards and regulations, while retaining all the technical advantages of AAC concrete

AAC panels have various applications, among which internal and external building walls can be mentioned. Steel rebars are placed inside these panels to strengthen them so that they perform better against various forces

Design Requirements In the structural design of AAC panels, the applied loads are determined according to Chapter 6 of the National Building Regulations and Standard 2800. The strength reduction coefficients for AAC panels depend on the intended conditions



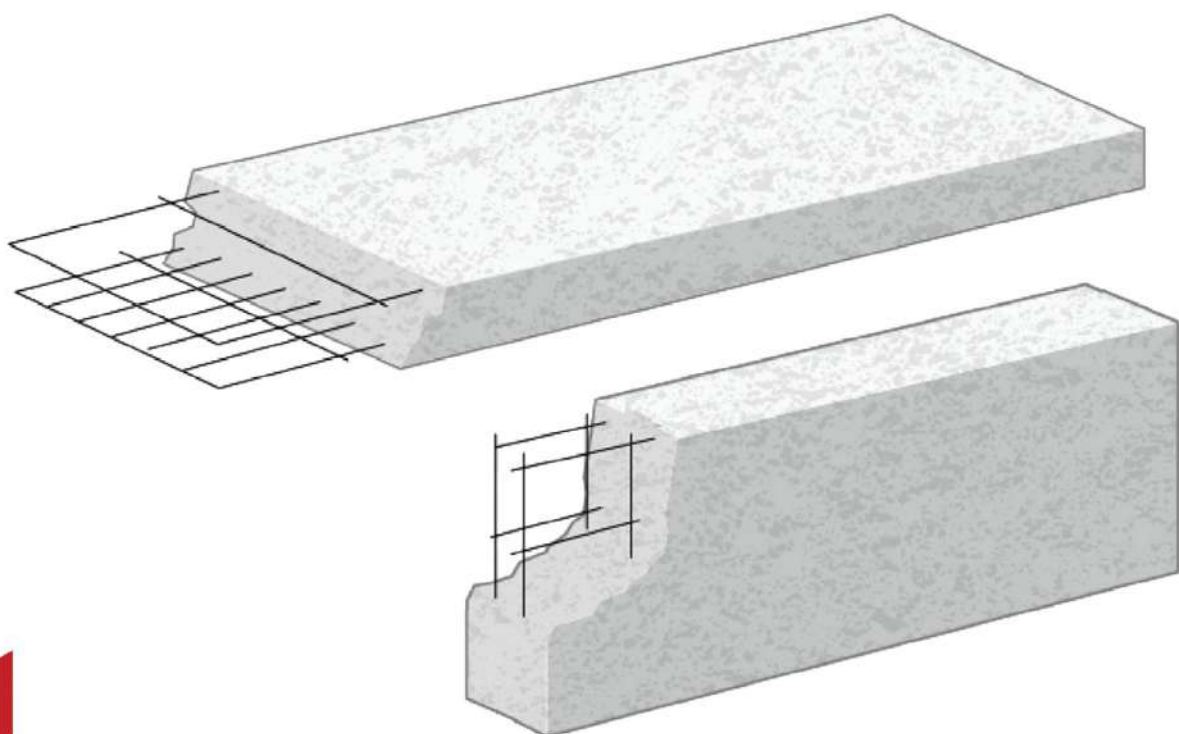
► Types of TBLEX Reinforced Panels

- Wall panels (interior and exterior)
- Floor and roof panels
- Partition wall

Wall panels are produced in various thicknesses and lengths according to the project's needs. Due to their excellent thermal and acoustic insulation properties, these panels significantly reduce energy consumption in buildings. Their lightweight nature greatly decreases the dead load on the structure, resulting in reduced dimensions of foundations, columns, and beams, ultimately lowering overall construction costs by 18–25% compared to traditional materials. Inside the panels, anti-corrosion coated reinforcement cages are precisely placed, and the panels are produced in desired dimensions using modern European machinery (HESS)

Table of TBLEX Reinforced Panel Dimensions

Panel Type	Length (cm)	Width (cm)	Thickness (cm)
Wall / Floor / Roof Panels	100 – 600	60	10-37/5

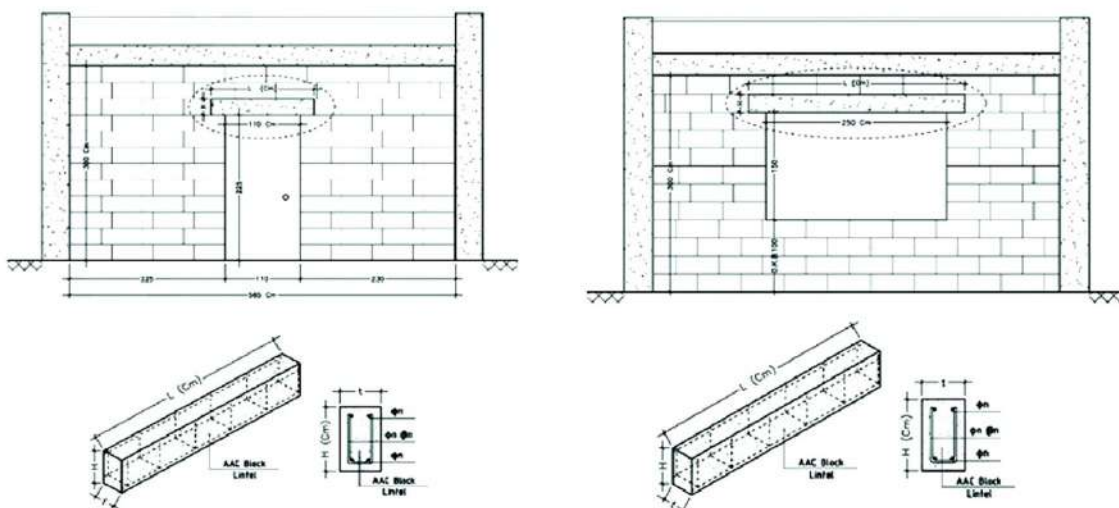


Lintel

According to Chapter 8 of the Iranian National Building Regulations, the lintel must be designed as a monolithic continuous beam capable of bearing loads and transferring forces to other elements. It must be executed continuously with a length equal to the total span of the opening plus the length of the adjacent piers, plus an additional 35 cm (minimum 20 cm or one-tenth of the opening span from each side of the wall – whichever is greater)

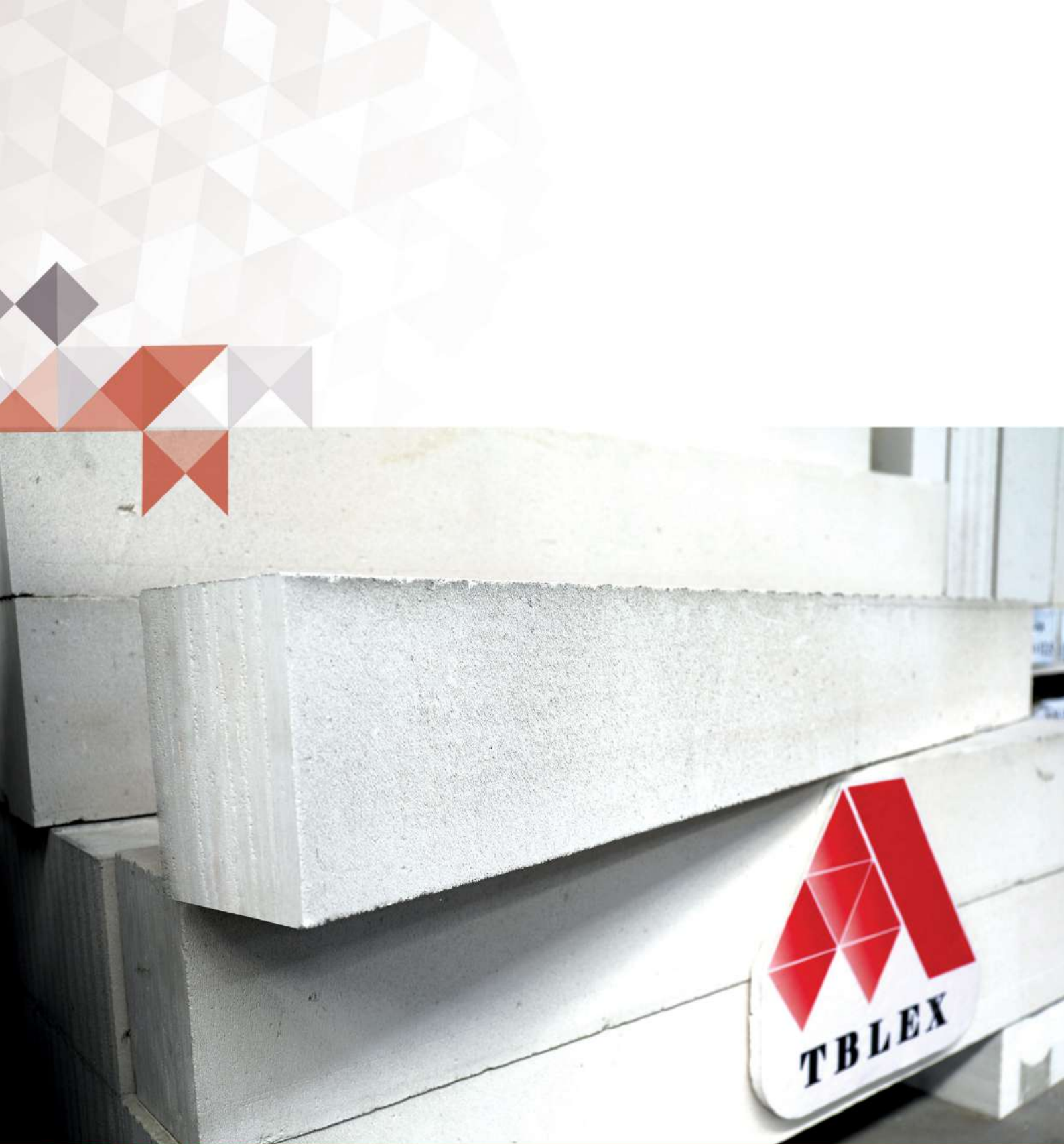
Among the advantages of reinforced lintels made from autoclaved aerated concrete (AAC) are

- ▶ No need for additional reinforcement at lintel locations due to being homogeneous with the AAC walls themselves
- ▶ No change in the thermal transmittance coefficient at the lintel area
- ▶ Creation of a perfectly uniform surface with the wall for plastering
- ▶ Ease and speed of execution
- ▶ Light weight



TBLEX Reinforced Lintel Dimensions

Panel Type	Length (cm)	Width (cm)	Thickness (cm)
Lintel	120 – 300	20 – 30	10 – 37.5



LINTEL



TBLEX

TBLEX For the construction of modern, standard, and sustainable buildings

Advantages of using TBLEX blocks and panels in construction projects



**Fire
Resistant**



**Lightweight
and Strong**



Waterproof



**Excellent
Sound
Insulation**



**Earthquake
Resistant
Design**



**Fast
Construction**



**-Non
Combustible
Material**



**Reduced Energy
Consumption
in Buildings**

Dry Ready-Mixed Mortar

The use of construction mortars is an inseparable part of the building process and has been common since ancient times. Considering the problems of traditional mortars such as variability in raw material quality, inability to rectify mistakes in case of material mixing errors, inability to add admixtures, and overall the risk of lack of control at scaledry mortar is used to bond lightweight concrete components, including blocks or panels, to each other. Furthermore, a wall leveling mortar can be produced, which is used as a surface coating for walls made of AAC (Autoclaved Aerated Concrete). Other applications of this product include grouting (joint filling) and repair .of concrete components



► Advantages of Prepared Dry Mortar

- Final quality control of dry mortar produced in the factory to ensure compliance with various national and international standards.
- Consumption in desired and required quantities.
- Higher execution quality and increased building longevity.
- Reduction of human error.
- Lower execution (application) costs.
- Time savings in application and increased construction speed.
- Minimal material wastage.
- High absorption rate.
- Easy to use.
- High compressive and tensile strength resistance.
- Cement savings.
- Minimal space requirement on the construction site.
- Easy transportation.
- Elimination of thermal and acoustic bridging (thermal and sound bridges) in application due to its 1–2 mm thickness between blocks.







TBLEX – Light & Resistant

Reducing the weight of buildings is one of the primary concerns in earthquake-prone countries like Iran. Using TBLEX blocks achieves structural weight reduction by



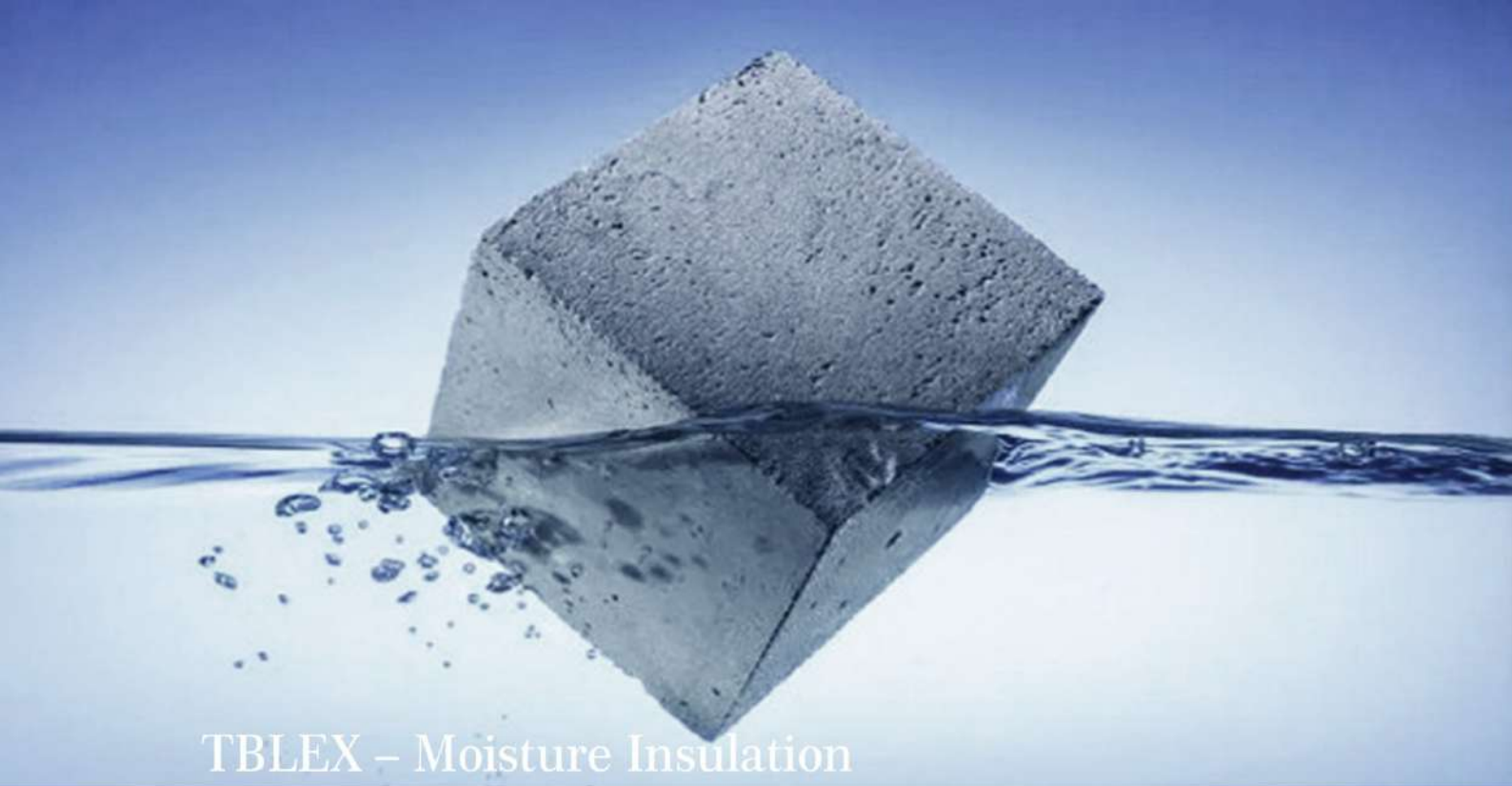
- ▶ Decreasing the weight of the structural skeleton by approximately 30%
- ▶ Reducing mortar consumption during installation by 25%

This not only significantly lowers the destructive forces of earthquakes but also considerably reduces overall construction costs

The reason for this exceptional lightness lies in the highly porous structure formed within the concrete 80% of the air in the initial slurry is retained, resulting in a density of less than 500 kg/m³

Parameter	Pressed Clay Brick	Hollow Clay Block	TBlex (AAC) Block
Dry Density (kg/m ³)	1700	750	450
Material Weight (kg/m ²)	170	75	45
Wall Weight with Required Mortar (kg/m ²)	201.5	89.5	47
Wall Weight with Two-Sided Plaster (Gypsum & Lime) and Whitewashing (kg/m ²)	278.5	150.5	60

Note: Dry density is in kg/m³, while weights are in kg/m² based on a specific assumed wall thickness.



TBLEX – Moisture Insulation

► TBLEX – Moisture Insulation

In addition to being resistant to water penetration, TBLEX blocks are also an excellent insulator against cold and are not vulnerable in winter weather conditions. The countless advantages of TBLEX blocks have made TBLEX one of the best-selling building materials

One of the most important advantages of TBLEX is its ability to act as a moisture barrier. TBLEX blocks can be used without any problem in the northern provinces. The amount of moisture that penetrates into the house will be much less than in old buildings constructed with cement blocks. TBLEX has a closed-cell porous structure, so it is not easy to get it wet. Even in the heavy rains that fall in the northern provinces and humid regions, TBLEX can serve as an effective insulator

In the event of a pipe break or burst inside the building, TBLEX blocks also act as a moisture barrier. Because of this insulation property, only the exact spot where the pipe has burst will become damp. Even if the problem is not fixed immediately, there is no cause for concern, because the spread of moisture to other parts of the building requires a very long time. For this reason, locating the burst point in buildings made with TBLEX will be simple

Freezing of water is accompanied by a 12% increase in volume, and this volume increase would destroy the fine cell structure if water were absorbed by the block. Since TBLEX has closed air cells and water absorption does not occur in this structure, freezing will not be observed

TBLEX – Fire Resistance

Fire resistance is expressed in terms of the number of hours a material can withstand a standard fire and is called the Fire Rating .(UL) – one of the most stringent building standards in the world TBLEX blocks demonstrate excellent fire performance. The main reason is their extremely high resistance to heat transfer, achieved through the use of completely non-combustible raw materials. One of the primary ingredients is silica, which dramatically raises the melting point and acts as a true thermal insulator against fire



TBLEX blocks not only offer greater fire resistance than most other building materials, they also produce no toxic gases and can withstand extreme temperatures up to 1,200°C. They achieve the highest UL fire rating among construction products

In a fire resistance test: A 20 cm thick wall made of AAC (TBLEX) blocks was exposed to flames at 1,200°C

- ▶ **After 2 hours:** no temperature rise was recorded on the opposite side
- ▶ **After 4 hours:** the temperature on the cold side rose only to 75°C

Furnace Insulation Board A special lightweight, highly porous insulation brick with an extremely low thermal conductivity coefficient is produced in standard size 50 × 50 × 5 cm (custom sizes available upon request). Used as a back-up refractory insulation brick behind the main firebricks in furnaces, this product dramatically reduces the high cost of conventional refractory bricks on the market





TBLEX as Sound Insulation

Noise pollution in machine-driven life and large cities has disrupted human comfort. Therefore, it is advisable to use materials in construction that reduce noise pollution in office, educational, residential buildings, and recreational centers. Controlling noise (unwanted sound) in buildings has a significant impact on the health and tranquility of the occupants

Due to their molecular structure and the distribution of pores and voids within them, AAC blocks are highly sound-absorbent. With a sound intensity reduction of 50 dB according to ASTM standards, they are classified in the category of excellent sound insulators



Sound Absorption Table of AAC Blocks with Different Thicknesses

Thickness	10 cm	15 cm	20 cm
Sound Absorption Value	39 dB	44 dB	50 dB
Sound Insulation Rating	Borderline Good / Very Good	Very Good	Excellent

▶ ***TBLEX – Outstanding Thermal Insulation***



Thermal insulation materials are those that effectively reduce the transfer of heat and cold from one environment to another. In buildings, they are far more critical on exterior walls that are directly exposed to outdoor air than on internal partitions

Thanks to millions of air-filled closed cells inside, TBLEX (AAC) blocks provide excellent thermal insulation

- ▶ ***Their thermal conductivity coefficient is only about 10% of ordinary concrete***
- ▶ ***The thermal resistance of a TBLEX wall is approximately 3 times higher than that of a comparable clay block wall***

Benefits of Proper Thermal Insulation in Buildings

- ▶ Significant energy savings and reduced heating/cooling costs
- ▶ Comfortable indoor temperature in both extremely hot and extremely cold weather
- ▶ Protection of the building structure against harsh weather conditions
- ▶ Lower energy consumption → reduced CO₂ emissions and contribution to combating global warming
- ▶ Up to 50% reduction in the size and capacity of required heating and cooling equipment

▶ **TBLEX – Eco-Friendly**



Environmental Advantages of TBLEX Blocks

- ▶ No clay is used in production Since clay is far more suitable for agricultural products, gardens, and farmlands, using this product prevents excessive destruction of soil and its improper consumption
- ▶ No construction waste is generated Using other traditional products creates a considerable volume of construction debris which, in addition to wasting cost and time, also harms the environment
- ▶ Reduction of air pollution Due to the high thermal resistance and the resulting reduction in fuel consumption for cooling and heating buildings, air pollution is largely prevented
- ▶ Recyclability Waste from some industries can be used as raw material for producing this product
- ▶ Non-perishable Given the constituent materials of the blocks, this product does not spoil and has a long lifespan. Because it is made from non-organic materials, it undergoes no change in properties or nature. No type of mold appears in it and it is not a suitable environment for microorganisms; as a result, insects such as ants, cockroaches, etc., do not nest or lay eggs in it



TBLEX – Faster Construction

Thanks to their light weight, easy and precise interlocking, and the elimination of several operations (especially the primary plastering of walls), construction speed with TBLEX in



Thanks to their light weight, easy and precise interlocking, and the elimination of several operations (especially the primary plastering of walls), construction speed with TBLEX increases up to 3 times compared to traditional methods

TBLEX blocks can be easily cut, shaped, and modified. Screws and nails hold firmly, and very small-diameter channels can be created effortlessly for electrical conduits and plumbing

This exceptional flexibility allows easy design, installation, and on-site adjustments in all areas of construction – a highly valuable feature

Comparison of Required Wall Thickness (cm) for Different Materials (to achieve the same thermal insulation performance)

Required Insulation Level	Traditional Brick	Clay Block	TBLEX AAC
10 cm	15	30	40
20 cm	20	20	25
30 cm	30	—	20



Installation & Maintenance Manual for TBLEX (AAC) Blocks

- ▶ Unload blocks using appropriate equipment
 - ▶ Remove packaging one day before installation and store blocks in a dry area
 - ▶ Keep pallets and dry mortar as close as possible to the work area
 - ▶ Store dry mortar in a dry place
 - ▶ Prepare mortar only in the required quantity according to the instructions on the bag; continue mixing until all air is removed
 - ▶ Before starting the wall, level the surface with 2–3 cm of sand-cement mortar
 - ▶ Up to 30 cm above floor level, apply a waterproofing layer before laying mortar
 - ▶ After placing each block, level its top surface and apply thin-layer adhesive to the vertical face
 - ▶ Precise alignment of the first row is mandatory
 - ▶ First execute the main (load-bearing) wall rows
 - ▶ To mitigate earthquake effects and thermal expansion/contraction, leave a 1 cm gap between AAC walls and concrete columns, beams, or walls. Connect metal ties vertically and horizontally every 1–3 blocks to the structure. Fill gaps with flexible material (e.g., polyurethane foam)
- Do not slide blocks into place; remove excess mortar with a trowel
- Vertical joints must be staggered (not aligned)
- Partition walls (thinner than main walls) are installed with a 1 cm gap and connected to the main wall using steel strips

Important Note (in dry climates): Although TBLEX blocks do not transmit moisture, their surface absorbs more water than many traditional materials. Therefore

- ▶ Before installation: thoroughly wet the blocks (water-spray them)
- ▶ After installation: if possible, spray water on the walls during the first few days



Certificates



Awards



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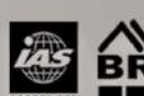
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