



AERATED CONCRETE (AC) BLOCK



CONTENTS

GENERAL

SYSTEM DESIGN

PRODUCT

PRODUCT PROPERTIES

PRODUCT SPECIFICATION

PRODUCTION PROCESS

CAPACITY CALCULATION

KEY PROCESS EQUIPMENT

SCOPE OF OFFER

ENGINEERING AND TECHNICAL ASSISTANCE

TRAINING AND START UP

PLANT LAYOUT

UTILITIES AND SYSTEM INSTALLATION

PERSONNEL REQUIREMENTS

MANUFACTURING FEASIBILITY COST ANALYSIS

TIME SCHEDULE

CONCLUSION

Detailed Product Description

Our aerate concrete plant can produces 20,000 - 80,000m³ building blocks and panels.

Features:

- 1) Good heat insulation and humid retention (IR=0.14)**
- 2) Nonflammable**
- 3) Volume weight: 400 – 800 kg/m**
- 4) Error of overall dimension: 1.5mm**
- 5) Sound insulation value RW: up to 52dB-A**

Raw material:

- 1) Sand, or pulverized fuel ash**
- 2) Cement**
- 3) Water**
- 4) Aluminum powder or gas former**
- 5) Concrete aditives**

Adjustors forming structures, water reducer, resistance increase, hardening catalyst and the additives which give plasticizer property are used.

Aerated Concrete (AC) products are 4 times lighter in weight than ordinary concrete

Its characteristic structure comprising millions of tiny pores, it offers optimum solidity at low weight. As air has a low heat conductivity, aerated concrete provides for excellent thermal protection. It protects from cold and heat, allowing for single-shell constructions which provide more space, save time and reduce costs-aspects which are of considerable importance to property developers

The Basic Materials:

Aerated concrete is made from natural raw materials – sand, cement and water -- with an aerating agent. The main material is quartzitic sand.



PRODUCT RANGE

1-PLAIN END BLOCK



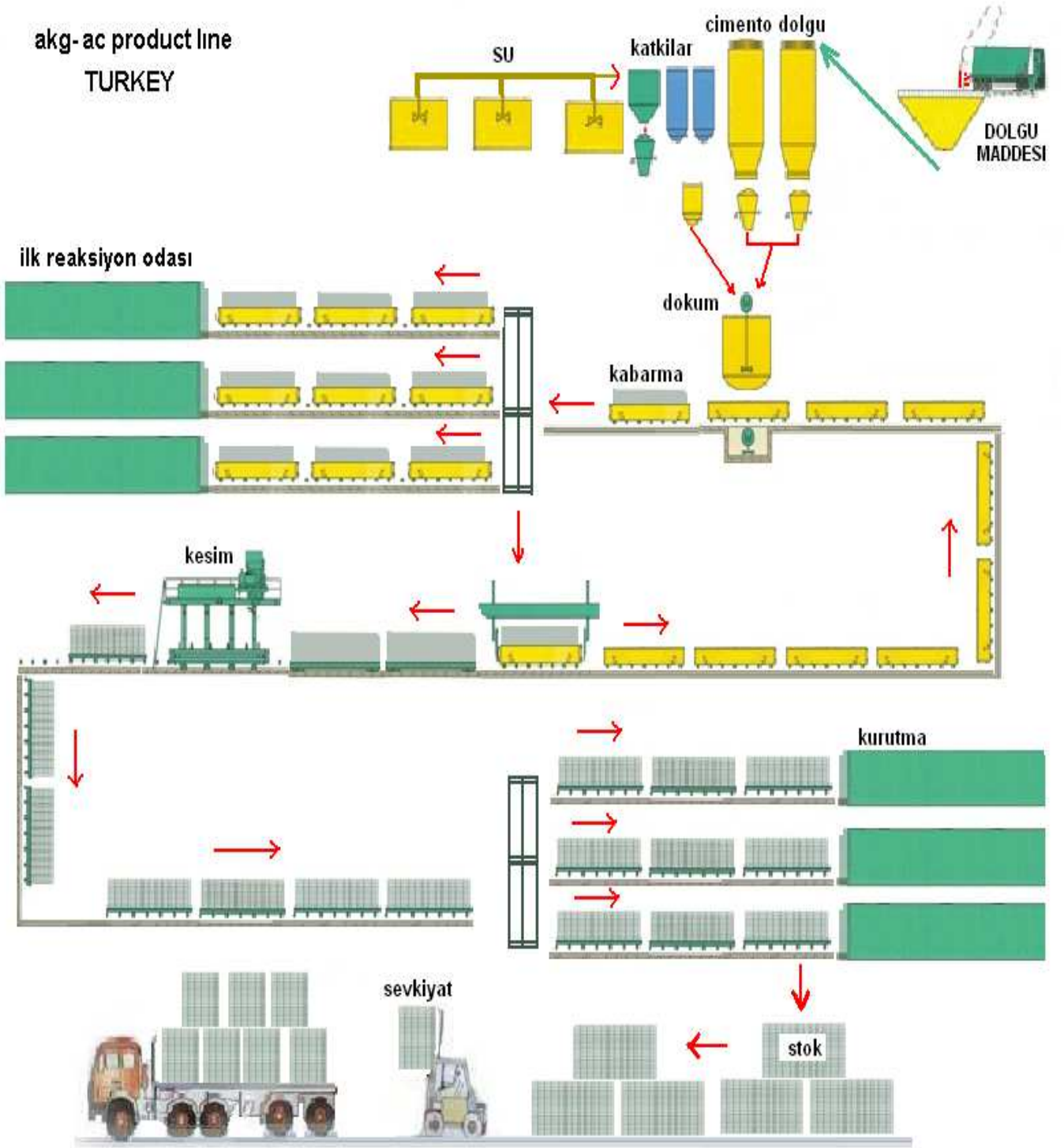
2-FLOOR BLOCK



3-INSULATION BLOCK



akg- ac product line
TURKEY



PRODUCTION PROCESS

AGGREGATE AND CEMENT PREPARATION

Cement and filling material is loaded in silos with elevator or vicinage system. Cement silo and filling silo should be set up close to (product mixer and measurer).Among the silos cement and filling material are given to dosing bunkers with the help of horizontal or connected helical carriers .Dry and fluid materials are dosed with the fully automatic system. To work the weighing system, weighing loadcells and pneumatic valves are used.

HOT WATER- THE SYSTEM MAKING UP GAS AND ADDITIVE

Before work, water is filled in storage tank from special drainpipes. Additive aluminium powder and other chemical additives are prepared in agitated additive tank forced from above. From measurer, water, aluminium additive and planar active additive are given and mixed continuously. Mixer is equipped with ventilating system, double layer water cooler unit and emergency drains in case of explosion. There is a grading relay which activates automatically the emergency system in case temperature exceeds 20C. In order to support production and electric energy saving it is advised to add 10-12c warm water minimum.

MIXTURE OF MATERIAL

Mixing all the dry and fluid mixtures are done at several stages.. The control of all the important stages of production and the stages of gas concrete material preparation are observed by centre control panel of factory. All the controlling of gas concrete preparation process is done from control panel situated below mixer storage and beside mold filling unit. The process of material dosing and mixing is controlled automatically by computers which are programmed according to gas concrete production in a quality wanted.

Operator controls all the restructuring stages in real time. When it is necessary, operator has the ability to change and correct the current structure, mixture time, degree of temperature and the other technic measures by main control panel or computer. Also the control system can pass to automatic or semiautomatic running settings.

MASSIVE SHAPING –CUTTING

Ready mortar is poured in metal molds. Shape of the mold is composed of 2 pieces: base plate and detachable covering. Base plate has the characteristic of a car which has 4 steel tires, its main part is a plywood and set on metal carcass. When the detachable coverings are attached in a 2 pieces L form, they consist of formative pieces taking a quadripartite shape. Before casting, detachable coverings are collected and greased with a special oil or laid with oil paper and placed in a base plate.

In order to obtain a hermetic binding, the pieces are adhered with a special compressor. In order to avoid any possible damage during transportation compressor is handed in separate from forms and adhering is done by the receiver. The form filled with gas concrete mortar with the vibration percussion technic is brought to mold creating platform with the help of carrier. Mold creating process depends on several elements. (cement which is a main construction material, temperature, the way of filling etc) It could variate between 4 hours and 8 hours. In order to obtain high resistance quality in product, it is important to create hard degree of temperature regime. According to the material used, temperature of the area before cutting 40 C-50 C (3-4 hours), the area after cutting 60 C- 80 C (up to 20 hours). Clearer temperature adjustments are done by the producer during manufacturing according to its observations. After resistance keeping wait process, coverings are dismantled and base plate together with its massive on it, is given to cutting unit. Coverings are cleaned, collected, greased and brought under the filling unit by being installed at base plate.

The massive which is tempered to plastic resistance stiffness is sent to cutting from transportation unit by being ignited with massive special igniter. Initially, the top part of the massive is shaved (2-5 cm) with cutter or saw with band. At second stage , sub-section of the massive is cut horizontally. At third stage secondary cuttings of the massive are done. After that, massive cut as blocks is brought to pushing unit with the aim of sending them to temperature and moisture process cabins. In order to obtain the necessary temperature and moisture process environment purchaser firm should construct hermetic tunnel cabin all of the surface of which has thermal insulating. Thanks to the temperature process with thermos system, thermal energy and steam appearing after the exothermic reaction hydration is used to the utmost degree. Massive which is cut after it goes under temperature nad moisture processes is removed with cars. Blocks are placed in carrier palets, removed with igniters and placed in stock yard or storage. Holding periods of ready concrete at later stages varies from one week to two weeks, based on purchaser firm's observations and by taking into consideration the normal temperature. Necessary waiting is done and ready gas concrete blocks are ready for sale.

PRODUCT PROPERTIES

PROVIDES INSULATION

Having a porous composition, **AERATED CONCRETE BLOCK** provides a high order of thermal insulation.

AERATED CONCRETE BLOCK is an ideal material that offers significant economies in the initial outlay and running costs of heating or cooling buildings as well as opportunity for exploiting other potential benefits.

LIGHTWEIGHT

Embodying no compromises in terms of strength, by reducing overall building loads with its low dead weight, significantly improves the seismic performance and safety of buildings. It is a low-density solid masonry material with a dry specific weight ranging from 400 to 800 kg per cubic meter.

FIRE-PROOF

According to DIN 4102 norms, **Is a Class 1 fire-proof material that can withstand temperatures up to 1,200°C. With this property, it is an intelligent choice where fire safety is of prime concern. As a side benefit of this property, it is highly resistant to weathering and is therefore a very durable material.**

PRECISION-MADE

Being manufactured to exact dimensions with very close tolerances, **BLOCK** provides high levels of accuracy in setting out.

Its smooth faces and sharp edges allow fair-faced finishing with or without liquid coatings. By the same token, rendering, where such a finish may be desired, can be kept extremely fine.

TECHNICAL DATA

Density	: 500 or 800 kg/m³
Shrinkage	: 0.05%
Sound Insulation	: 39dB* (100 mm block wall)
Thermal Conductivity	: 0.16 W/m C
Vapour Resistance	: 2.16 x 10⁴ msN/mm² kg

Fire Rating Performance

Fire Resistance Period (hr.)

1	hr	50	Partition Thickness Mm
2	hr	63	Partition Thickness Mm
3	hr	75	Partition Thickness Mm
4	hr	100	Partition Thickness Mm
5	hr	130	Partition Thickness Mm
6	hr	150	Partition Thickness Mm

**AC can be produced in a wide variety of products.
Typical product characteristics are:**

• Block dimensions:

_- block length: 600 mm +/- 1,5 mm

_- block height: 200 and 250 mm +/- 1,0 mm

_- block thickness: 75 – 350 mm +/- 1,0 mm

. • Density range: 400 – 1000 kg/m³

. • Compressive strengths: 1,5 – 5,0 N / mm²

. • Thermal insulation:

R-value = 0,09 – 0,16 W/[mK],;

U-value for 200 mm block is ca. 0,52 W/m².K

. • Fire rating: Non-combustible – min. 4 hours, up to 6 hours

. • Sound insulation: 2 dB bonus.

Plant concepts and investment costs

We can provide you with several types of AC production plants based on the standard plant range is designed for production capacities from 50 up to 220 m³/day. Depending on your requirements for capacity and the product specification we will make a recommendation on the technology to be used. Generally an plant comprises following sections: as an integral plant concept:

. • Raw material storage and handling;

. • Slurry handling;

. • Mixing and dosing;

. • Mould systems;

. • Cutting line;

. • Bogey system;

. • Steam preparation;

. • Unloading;

. • Packaging;

. • Reinforcement treatment and handling (if required);

. • Reinforcement production (if required).

The estimated investment for an AC plant for block production is indicated in

the table below depending on the plant capacity. The investment estimates are exclusive of the cost for the purchase of land and the civil construction work for foundations and buildings.

Theoretical production capacity

Effective production time Investment cost for machinery and equipment*

50 m³/day 22,5 hours/day
100 m³/day 22,5 hours/day
150 m³/day 22,5 hours/day
220 m³/day 22,5 hours/day

Project planning

Generally we recognize the following stages in the development of a new AC plant project:

- . • Market analysis (product demand, sales prices of AC, AC plants in region, etc.);
- . • Availability of raw materials (suppliers, delivery frequency, quality, prices);
- . • Machinery (suppliers, prices, type of machinery required, automation grade needed);
- . • Governmental policies-restrictions (building, land, machinery, product requirements);
- . • Land (size, availability, paving, testing, etc.);
- . • Building (suppliers, etc.);
- . • Total financial analysis (estimated turnover, return-of-investment, etc.)

Furthermore we are able to assist you in the following above-mentioned stages:

- . • We are able to support you with an economical feasibility study to estimate your specific return-on-investment (ROI), expected turnover, learning curve, etc. in your situation. If you wish we can send you a template file with the required input parameters for the model, like interest rates, electricity costs, etc. Subsequently we will process the data, with which you will receive a detailed economical feasibility report. We prefer to continue with this feasibility tool if our budget quotation is in your line of expectation.

- . • Overall consultancy on the machinery and civil Works

**MUSTAFA AKGUL
MACHINE CO LTD
IZMIR - TURKIYE**

**Factory tel : + 90 232 257 59 59
Office tel : +90 232 251 91 00
office fax : +90 232 251 91 19
Gsm : + 90 532 797 03 79
http : www.mustafaakgul.com
e-mail : info@mustafaakgul.com**

















