

# Hebel Autoclaved Aerated Concrete (AAC)





**All the benefits with one product**

**Speed of Construction** ✓  
2-10 x faster than conventional building

**Technical Performance** ✓  
Fire / Thermal / Sound

**Contractor Friendly** ✓  
Standard masonry skills

**Cost Effective** ✓

# › Everite Building Products, the Xella Group and Hebel

Established in 1941, Everite Building Products, renowned for its range of Nutec Fibre Cement roofing, ceilings and cladding materials and has over the years been recognised for its role in Advanced Building Technology (ABT) systems.

The success and experience gained in ABT has led to the appointment of Everite Building Products as a licensee of Hebel Autoclaved Aerated Concrete by the Xella Group. Everite Building Products is the only producer of AAC in Africa.

AAC as a building material has gained a considerable share of the international construction market since its inception in the 1920's in Sweden. Today it maintains its reputation of the building material of the future. It is viewed as a revolutionary material that offers a unique combination of strength, light-weight, thermal insulation, sound absorption, unsurpassed fire resistance and unprecedented ease of construction.



Fire resistant



Thermal insulation



Sound insulation



Ease of use and workability



Speed of construction



Low carbon footprint



Low heating and cooling costs



Lightweight and strong





# Hebel the product

## Composition and manufacturing process



Autoclaves at Everite Building Products in the process of being commissioned. Green AAC blocks and panels are fed into autoclave for high pressure steam curing.



Hebel is a lightweight autoclaved aerated concrete which is completely cured, inert and stable form of calcium silicate hydrate. It is a structural material, approximately one quarter the weight of conventional concrete, composed of minute cells which give the material light weight and high thermal insulation properties. It is available as blocks and pre-cast reinforced units, i.e. floors, roofs, walls and lintels.

Autoclaved Aerated Concrete (AAC) is made from sand, lime, cement, water and aluminium powder acting as a foaming agent to form a homogenous cellular structure known as calcium silicate hydrate.

This porcelainic reaction results in a unique and extremely stable tobermorite chemical structure. The mixing results in a chemical reaction which expands the mixture to form small, finely-dispersed air spaces. The mix is poured into moulds and allowed to set for a few hours while the chemical reaction continues.

The semi solid material is removed from the moulds and then cut to shape in various lengths and profiles. The final phase in the production process is high pressure steam

curing in autoclaves for up to 12 hours. It is this autoclaving process that gives this material its unique and superior performance characteristics over any other.

Hebel reinforced elements, such as slab panels and wall panels, contain specially coated steel to prevent corrosion and gives the material both dimensional accuracy and stability.

The steel reinforcing is placed in the moulds before the mix is added. The manufacturing process is then the same as described above for unreinforced elements.

### Benefits

- One quarter the weight of conventional concrete
- Extremely stable
- Superior technical performance characteristics



Close-up view of aerated autoclaved concrete - a homogenous cellular structure known as calcium silicate hydrate. These minute cells give the material its light weight and high thermal insulation properties.



Hebel Block. Each block is perfectly sized and on-site cutting during the building process is kept to a minimum. The naturally smooth surface of Hebel only requires a skim coat finish and eliminates the need to plaster conventionally. Although a 10 mm conventional plaster can be done, internally walls only require a gypsum skim coat

# Hebel

## Features and Benefits

The following impressive attributes of AAC make Hebel an innovative, sustainable and proven building material and are summarised by the following qualities:



### High speed of construction for an economical building process

Hebel panels are faster to construct and require significantly less labour when compared to traditional masonry construction techniques leading to substantial savings and reduced on-site costs depending on finish required.

- Building with Hebel also means a cleaner safer work area during construction and less clean-up at completion of building.
- Fast installation and easy workability with simple tools result in lower construction costs.
- Can be cut and shaped like wood with simple hand tools.
- Chasing of walls can be done by hand or with a wood router.
- Smooth finish can substantially remove plastering trades.



### Load-bearing capacity for the most unexpected situations

Being a masonry product, Hebel blocks and panels provide the attributes of being solid, strong and secure - all of these normally only associated with traditional bricks. Our 600 kg/m<sup>3</sup> density product has a 5 MPa compressive strength and is rated for building up to 4 stories and in earthquake zones due to its high strength to weight ratio.



### Outstanding fire resistance for maximum protection and safety

Non-combustible and renowned for its highly fire resistant properties. For example, a 150 mm thick AAC Hebel wall withstands direct fire exposure for up to 6 hours.

A standard 100 mm thick Hebel wall can withstand temperatures for 4 hours.



### Thermal insulation in winter and summer for long-term reduction in energy consumption

The enhanced insulation performance is 5 times that of brick of the same thickness. The thermal efficiency reduces the reliance on heating and cooling appliances, and provides up to 60% reduction in heating and cooling costs.

# Green Properties

## Manufacturing Transportation Technical Performance

AAC has been produced for more than 70 years, and it offers several significant advantages over other masonry materials, one of the most important being its lower environmental impact.



The modular size and light weight properties of AAC block is perfect for pallet stacking - from factory to site.



Mechanical handling of AAC block.



Suitable for use up to 4 stories high.



Perfect internal climate control no matter what the weather does outside.

### Manufacturing

- During the manufacturing process of AAC blocks, waste from the cutting process is recycled back with raw materials and used again.
- Manufacturing of AAC Blocks consumes approx. 70% less energy when compared to the manufacturing process of clay brick.

Reference:

International Journal of Engineering Research & Technology

ISSN: 2278-0181 IJERTV3IS110454

www.ijert.org Vol. 3 Issue 11, November-2014

### Transportation

- AAC travels further - more square metres of walling per load. The lightweight and size characteristics of AAC block allows for reduced transport costs when compared to conventional brick.

### Technical Performance

- Thermal: allows the interior to remain cool in summer and warm in winter.  
150 mm panel = U - value of 0.85 W/m<sup>2</sup>K  
= R - value of 1.17
- Sound:  
100 mm panel Rw = 40 dB  
150 mm panel Rw = 46 dB



# Cost effective building material



Netherlands: Architects offices

Wall panels laid horizontally, cut to size at factory, on site cutting minimal and can be done with circular or band saws.



The cost of Hebel panels and blocks are only a part of life cycle costing of a building. When factors such as transportation (Hebel is light weight) assembly, and finishing, as well as the energy efficiency, fire protection, maintenance, durability and environmental properties are considered, Hebel provides an economical solution for the lifespan of the building.

- Savings of up to 15% in structural costs (foundations and structure) attributable to low mass to strength ratio properties of AAC.
- Reduced weight of walls: Typical brick and mortar wall load is approx. 350 kg / m<sup>2</sup>. AAC blocks wall load is approx. 90 kg / m<sup>2</sup>.
- Reduced wall thickness with commensurate performance properties.
- Improved labour and time savings.
- Improved transport costs reduction.
- Improved reduction of waste.
- Improved plastering (less waste due to uniform surface).

# Hebel Toolbox



Circular saw.



Hand saw.



Wave nail.



Adhesive applicator.



Hand-held conduit chaser or router.



Easy to nail.



Easy to screw in without pilot hole or plug yet retain exceptional pull out strength.



Netherlands: Shopping centre in Amsterdam

Dual purpose fire escape and acoustic barrier to freeway noise

# Quick Facts

Certification   Speed of building comparison   Hebel Sizes

## Certification

- **Blocks: SANS 50771-4:2014/EN 771-4:2011**  
Specification for masonry units - Part 4: Autoclaved aerated concrete masonry units.  
Specifies the characteristics and performance requirements of autoclaved aerated concrete (AAC) masonry units for which the main intended uses are types of load bearing and non-load bearing applications in all forms of walling.
- **Panels: EN12602.**
- **Agrément Certification: 2016/509**
- **Rational Design on request.**

## Speed of building comparison

- Conventional brickwork is normally done by a two man team (bricklayer and helper).
- Building with AAC blocks using a two man team is twice as fast compared to building with conventional brick.
- Building with AAC panels using a four man team is 10 x as fast compared to building with conventional brick.

Further advantages of Hebel include much faster and neater chasing for electrical and plumbing fixtures with a wood router or hole saw. This is unlike for brickwork where hammer and chisel is necessary to complete the job.

Finishing: Conventional brickwork requires plaster and skim coat for a perfectly smooth finish whereas the extra naturally smooth surface of Hebel only requires a skim coat.

- **Hebel Block Size**  
600 x 250 x 110 mm (Mass = 10.2 kg)  
600 x 250 x 150 mm (Mass = 15.2 kg)
- **Hebel Panel size (600 mm width)**  
Thickness: 100 mm; 150 mm.  
Length: 2400 mm; 2700 mm; 3000 mm.
- **Special sizes on request.**  
Windows / Door panels



Carribean Villa :  
3rd week of construction



# AAC in Africa



Angola: Project size 45000 units.



Work in progress.



Installation of slab.



Interior.

Manufactured by  
**EVERITE**<sup>®</sup>  
Established in 1941

A subsidiary of  
**GROUP FIVE**  
structured ingenuity

Everite Building Products (Pty) Ltd.

0861 333 835

+ 27 11 439 4400

[www.everite.co.za](http://www.everite.co.za)

Hebel is a registered trademark of the Xella Group