



AUTOCLAVED AERATED CONCRETE

PRODUCT APPLICATIONS &

August 2023

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SECTION 1

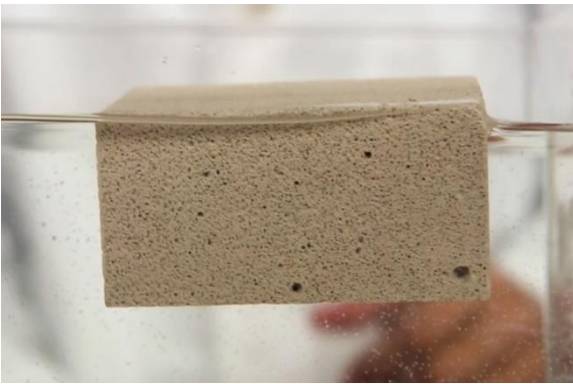
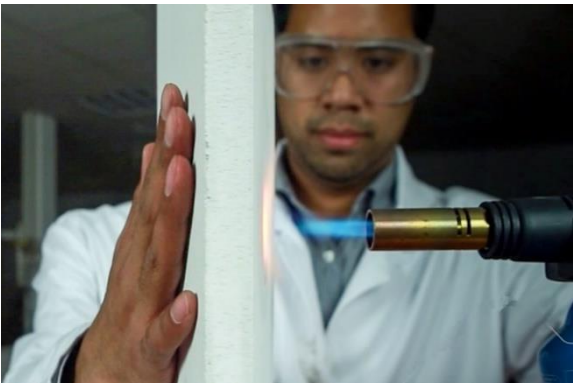
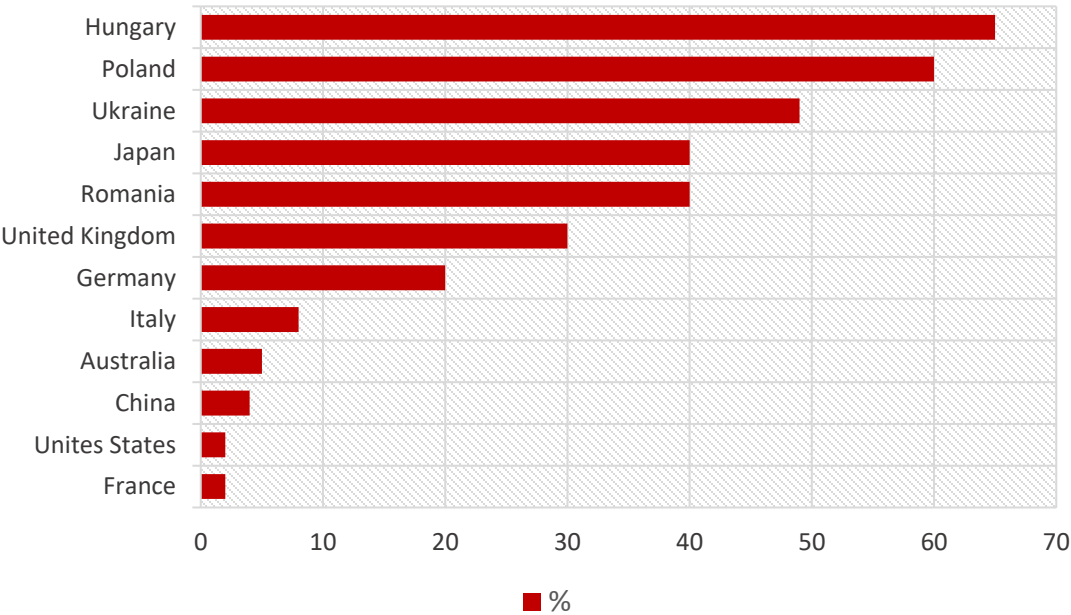
INTRODUCTION TO AAC

AUTOCLAVED AERATED CONCRETE

Lightweight pre-cast material offering structure, insulation, fire and mold resistance

- AAC is a lightweight, pre-cast building material that simultaneously provides structure, insulation, fire and mold resistance
- AAC was developed in Sweden in the 1920's has been **present in the global market for over 80 years** (to date >1000 AAC plants operate worldwide)
- Exceptional accuracy and easy handling allows for **very fast construction with AAC**
- AAC is made from **abundant raw materials**: sand, cement, lime and gypsum
- AAC is approximately **80% air**, the finished product is up to 5 times the volume of the raw material consumed in its production
- AAC is extensively used in **residential, commercial and industrial construction** and has a market penetration of 20% in Germany, 30% in the UK and 40% in Japan
- AAC is recognized as a **“green” building material**, certified for **LEED credits in the US**

GLOBAL AAC MARKET SHARES





SUSTAINABLE

The energy required to produce AAC is 2-3x lower than traditional concrete or bricks. Due to its lower weight the emissions from transportation are also lower. In addition, AAC’s natural insulation causes very low thermal conductivity (λ of 0.10; 7 – 10x lower than bricks and concrete), greatly enhancing energy saving and eliminating the need for additional insulation materials.



SOUNDPROOF

Due to the air pockets contained inside, AAC has excellent acoustic insulation properties. AAC has a sound insulation value of 7 decibels greater compared to other building materials of the same weight. AAC typically receives an STC score between 40 and 65.00.



LIGHTWEIGHT

AAC is a lightweight, pre-cast building material about 25 – 30% the weight of traditional concrete or bricks. Despite its low weight AAC is strong and can be used in both load-bearing and non load-bearing walls, roofs and floors. Using AAC reduces the dead weight of a building (resulting in foundation cost savings) and increases the chances of survival in case of earthquakes.



FAST CONSTRUCTION

Due to their light weight, AAC blocks can be handled in large sizes (e.g. 60cm x 50cm) on site without the need for lifting tools, greatly enhancing the speed of building compared to traditional methods. AAC wall panels allow for even faster building, only requiring simple lifting tools. The high accuracy of AAC elements also reduces the time required for finishing.



Lightweight

AAC is a lightweight, pre-cast building material about 25 – 30% the weight of traditional concrete or bricks. Despite its low weight AAC is strong and can be used in both load-bearing and non load-bearing walls, roofs and floors. Using AAC reduces the dead weight of a building (resulting in foundation cost savings) and increases the chances of survival in case of earthquakes.



Strength

Due to the autoclaving process causing a crystal (Tobermorite) structure, AAC is a strong building material with load-bearing capacity. Non-reinforced elements have a compressive strength up to 4.5 Mpa while reinforced elements may reach 8.5 Mpa.



Fire Resistant

Its strong thermal insulation properties provide AAC elements with exceptional fire resistance characteristics. AAC is inorganic, neither flammable nor combustible and does not emit toxic gasses. AAC can withstand the stress of fire up to 4 hours without any impairment to its stability.



Fast Construction

Due to their light weight, AAC blocks can be handled in large sizes (e.g. 60cm x 50cm) on site without the need for lifting tools, greatly enhancing the speed of building compared to traditional methods. AAC wall panels allow for even faster building, only requiring simple lifting tools. The high accuracy of AAC elements also reduces the time required for finishing.



Natural Insulation

Autoclaved aerated concrete is a cement-based building material with millions of microscopic closed-cell air bubbles contained inside. The natural insulation due to the air enclosed in the product provides AAC with excellent thermal and acoustic insulation properties without the need for additional insulation materials.



Soundproof

Due to the air pockets contained inside, AAC has excellent acoustic insulation properties. AAC has a sound insulation value of 7 decibels greater compared to other building materials of the same weight. AAC typically receives an STC score between 40 and 65.



Versatile

AAC products can be produced in many different sizes and shapes to suit the intended purpose. Moreover AAC can be easily cut, carved and milled in irregular shapes to be used in any design.



Sustainable

The energy required to produce AAC is 2-3x lower than traditional concrete or bricks. Due to its lower weight the emissions from transportation are also lower. In addition, AAC's natural insulation causes very low thermal conductivity (λ of 0.10; 7 – 10x lower than bricks and concrete), greatly enhancing energy saving and eliminating the need for additional insulation materials.



Durable

AAC is a strong, inorganic, non-toxic, and does not shrink, rot, warp, corrode, and is termite and mold resistant. This extreme durability makes the product virtually maintenance free, eliminating the need for repair materials, pesticides, and chemical treatments. AAC does not lose strength or deteriorate over time.

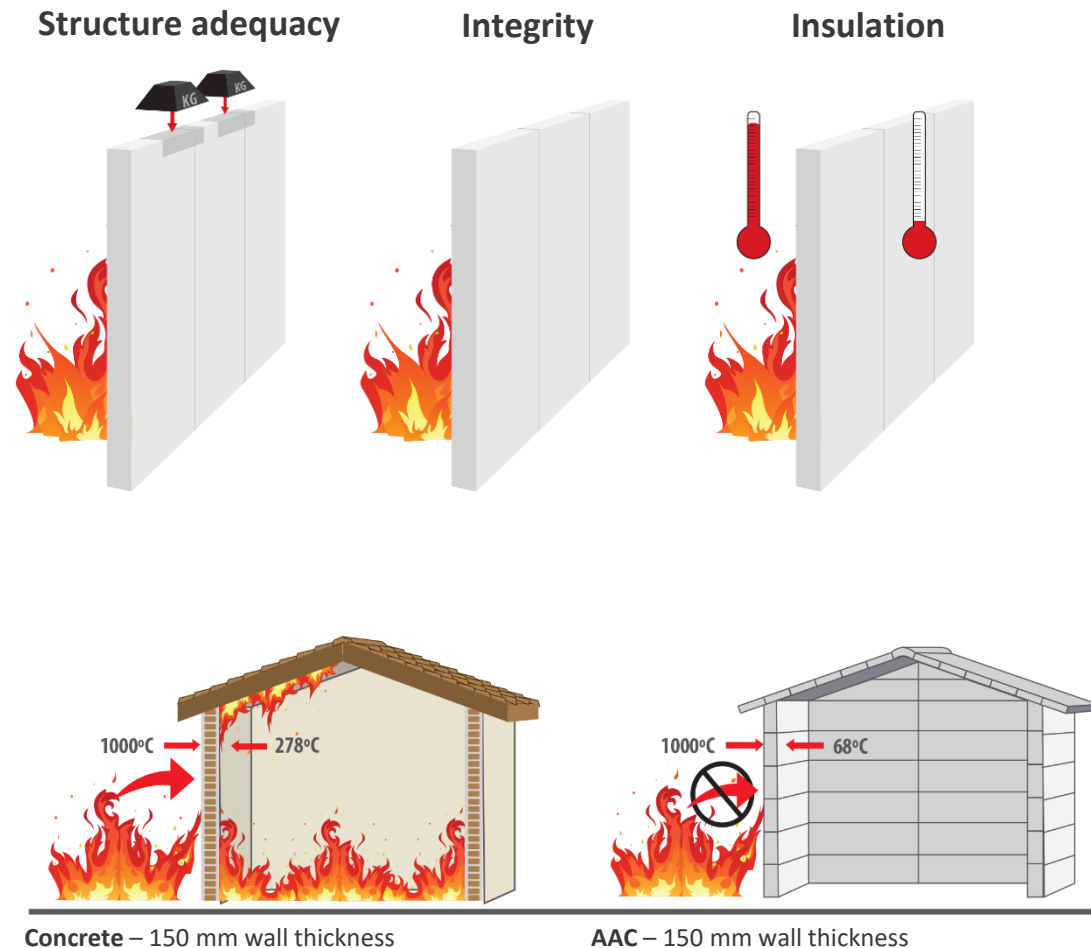


Accurate

AAC blocks and panels are produced with very high geometrical accuracy of within 1mm tolerance. This accuracy results in costs reductions due to savings on quantity of mortar needed and reduction of waste on site. The accuracy also improves the thermal and acoustic insulation performance through the avoidance of cold/air bridges. In addition the unique Aircrete SUPER SMOOTH cutting technology produces extremely smooth surfaces, minimizing finishing and plastering time and costs.

Fire resistance: very high fire resistance rating

- It goes without saying that the fire resistance of a structure is crucial to the health and safety of the users of the structure
- Likewise it important to the protection the value of inventory and the property itself.
- Its cellular properties provide AAC elements with exceptional fire resistance characteristics
- AAC is inorganic and is neither flammable nor combustible. It does not contain and therefore does not emit any toxic gases
- AAC is capable of withstanding the stress of fire up to 4 hours without any impairment to its stability
- AAC structures seal off flames, smoke and heat, allowing to maintain low temperatures on the other side of the building element
- AAC has a UL score of 4 in the US and an A1 classification under European regulation

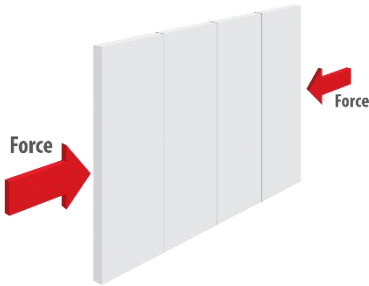


Compressive strength: lightweight material with load-bearing strength

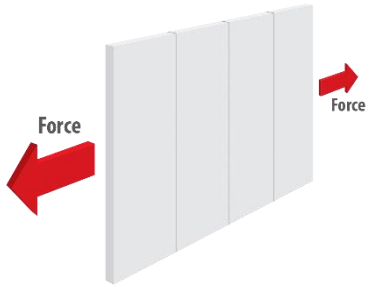
- The compressive strength of the material is the main contributing factor to the strength of the final structure
- Country-specific norms specify the minimum required compressive strength for building materials applying uniformly defined stress metrics and values
- Based on such requirement values the structural properties of the given material are determined when designing a structure, which are in turn used to calculate the load bearing capacities of the final construction
- AAC is a cement-based, concrete-like material. The autoclaving process, causing the formation of Tobermorite crystals, greatly enhances the structural strength of the product
- Although AAC’s density is on average around 25-30% that of conventional concrete (or 50% of clay bricks), it still has about 50% the bearing strength
- AAC’s stress values will differ as a range of factors can affect its strength, including moisture, type of cement and silica content of sand
- The standard compressive strength range of AAC blocks is usually ~1.8 – 4 Mpa
- The steel reinforcement inside AAC panels increases the compressive strength up to 8.5 MPa¹, allowing for load-bearing applications
- Stand-alone AAC has the capacity to be utilized both in low and high-rise construction

¹ Source: CEB, 1977

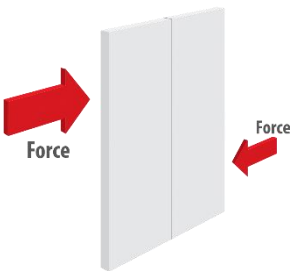
Compressive strength



Tensile strength



Shear (Flexural) strength



AAC AVERAGE STRESS VALUES

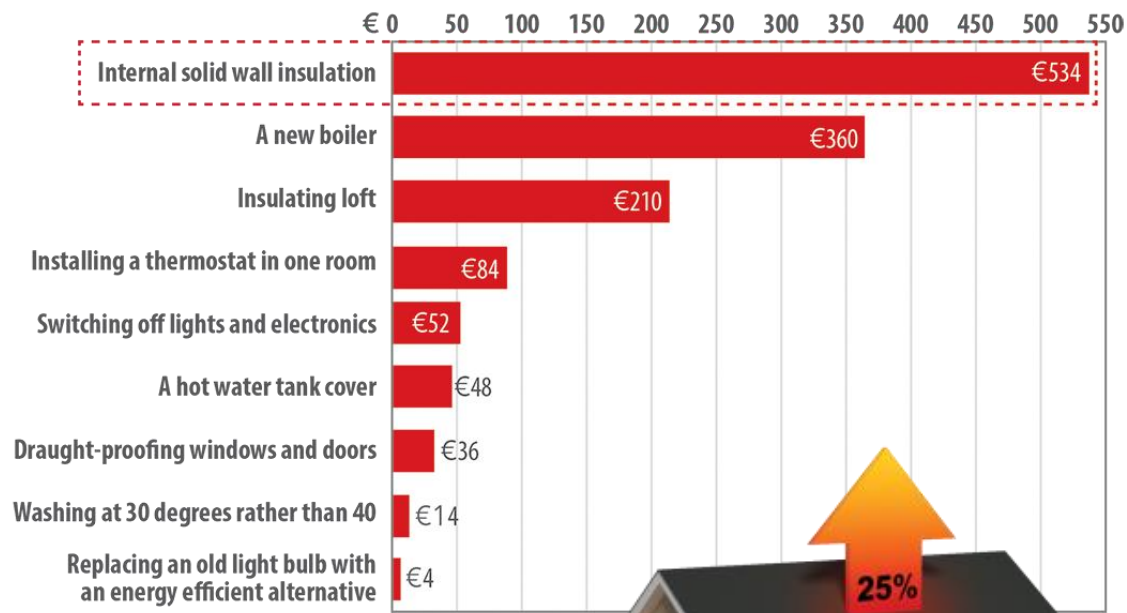
	AAC Nominal Density (kg/m³)			
	Units	400	500	600
Min. Compressive Strength	Mpa (psi)	2.4 (348)	3.5 (580)	4.5 (870)
Min. Shear Strength	Mpa (psi)	0.8 (116)	1.3 (193)	2.0 (290)
Min. Tensile Strength	Mpa (psi)	0.6 (87)	1.0 (145)	1.5 (217)

Source: AERCON AAC – Technical Manual

Thermal insulation: porous structure ensures great thermal insulation properties

- Heat transfer occurs due to varying ambient temperatures and it is extremely important to keep buildings cool/warm during summer/winter respectively
- People rely on energy (fuel, electricity) to heat/cool buildings and therefore invest in insulation to reduce energy spendings
- Green building (or even zero-energy building), is an emerging trend in the global construction industry. It has become a priority of many governments (see e.g.. European Commission Energy Efficient Directive) which (in)directly stimulates energy efficient construction methods
- Achieving high energy efficiency has become a regular building requirement and the construction and building materials sectors are adapting to this trend
- Main energy losses occur through the building envelope (i.e. roof and walls), which in turn is largely dependent on the building material chosen. See graphics on the right.
- The cellular nature of AAC provides it with strong natural insulation properties. AAC with density of 400kg has a λ -value of 0.10
- AAC stand alone can meet EU insulation requirements, in contrast with aggregate concrete, clay brick and calcium silicate masonry units which need to be used in combination with insulation materials, thereby adding to their cost and environmental impact¹
- Using AAC means achieving better energy efficiency and savings throughout the building life cycle

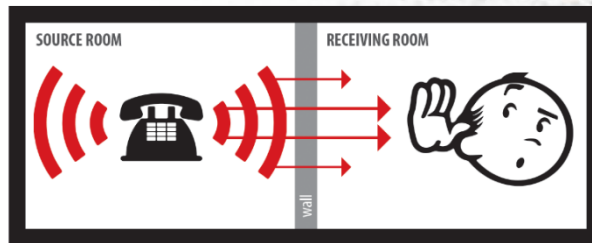
ANNUAL COST SAVINGS OF ENERGY EFFICIENCY MEASURES



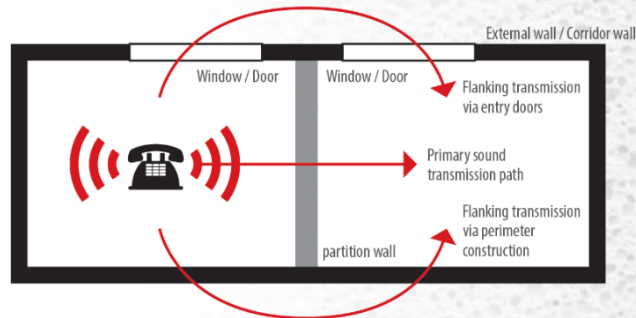
Acoustic insulation: excellent acoustic insulation properties despite low weight

- Noise pollution is an important factor in the well-being and perceived comfort of building occupants
- Buildings must provide an environment that is restful and relaxing and which maintains privacy for the occupant. This is particularly true for multi-family dwellings, hotels, hospitals, schools and offices
- The acoustic performance of a building depends on the entire wall construction, including insulation materials, windows, finishing, furnishing, cavity, building method and accuracy
- AAC is a porous material with excellent acoustic insulation properties
- Increasing the weight of a sound barrier (e.g. heavier building material) will reduce sound transfer, but will also increase costs of the entire structure
- AAC has a sound insulation value of 7 decibels greater compared to other building materials of the same weight. While it is 4-5 times lighter than traditional concrete (hence less mass), the STC score of AAC is only slightly lower
- AAC typically receives an STC score between 40 and 65, depending on the number of layers, thickness and density of AAC blocks / panels used, as well as on type of finishing

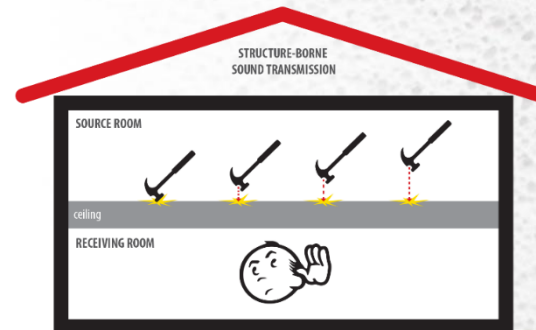
AIRBORNE SOUND



AIRBORNE SOUND - FLANKING

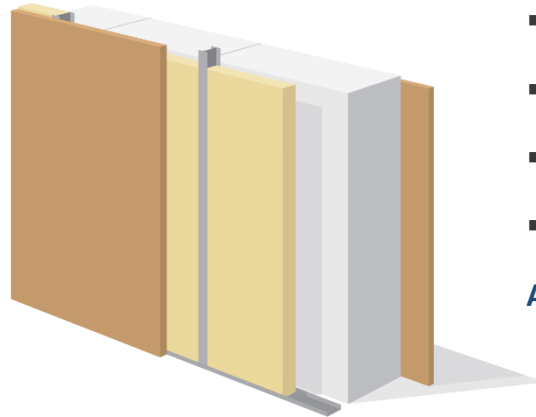


IMPACT SOUND



AAC WALL WITH CAVITY AND STEEL STUD WITH GYPSUM BOARD WALL

- 10mm Gyprock plasterboard
- S4 Bradford polyester insulation
- 64mm steel stud
- 20mm airspace (cavity)
- CSR Hebel Thermoblok 150mm (470kg density)
- 10mm Gyprock plasterboard

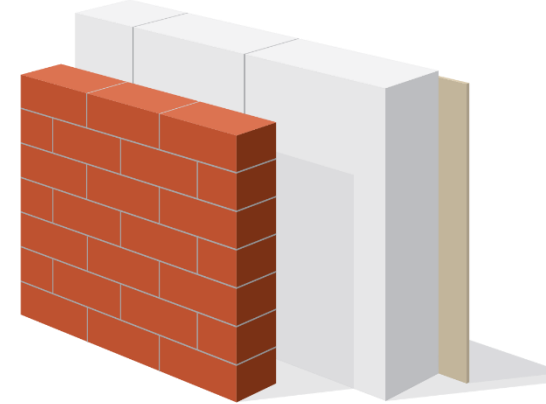


Acoustic Score: Rw 56 (Rw + Ctr 47)

BRICK FAÇADE WALL WITH CAVITY AND PLASTERED AAC WALL

- Brick façade
- 38mm (1.5") air space
- 203mm (8") Hebel USA AAC (400kg density)
- 95mm (0.357") gypsum plaster

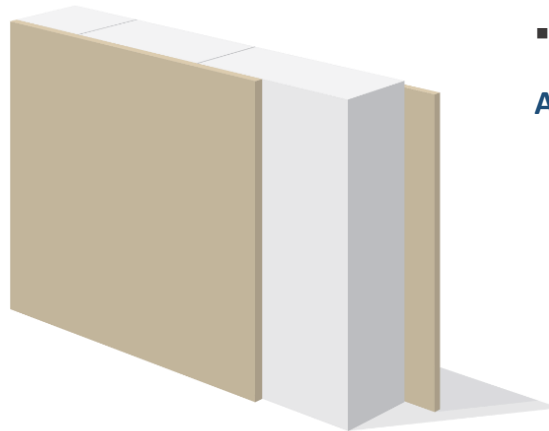
Acoustic Score: STC 57



AAC WALL PLASTER FINISHING ON BOTH SIDES

- 13mm cement (dense) plaster
- 215mm Celcon AAC (density 600)
- 13mm cement (dense) dense plaster

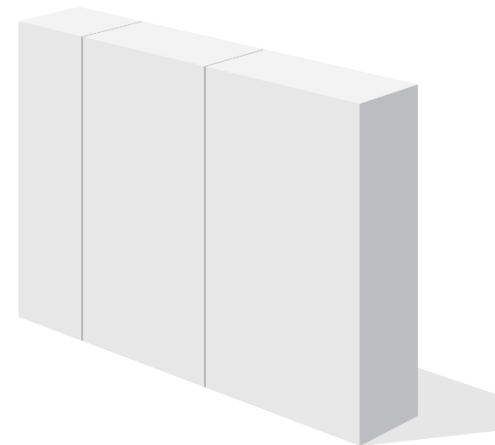
Acoustic Score: STC 52



AAC WALL PLASTER WITHOUT FINISHING OR CAVITY

- 240mm Ytong AAC (350kg density)

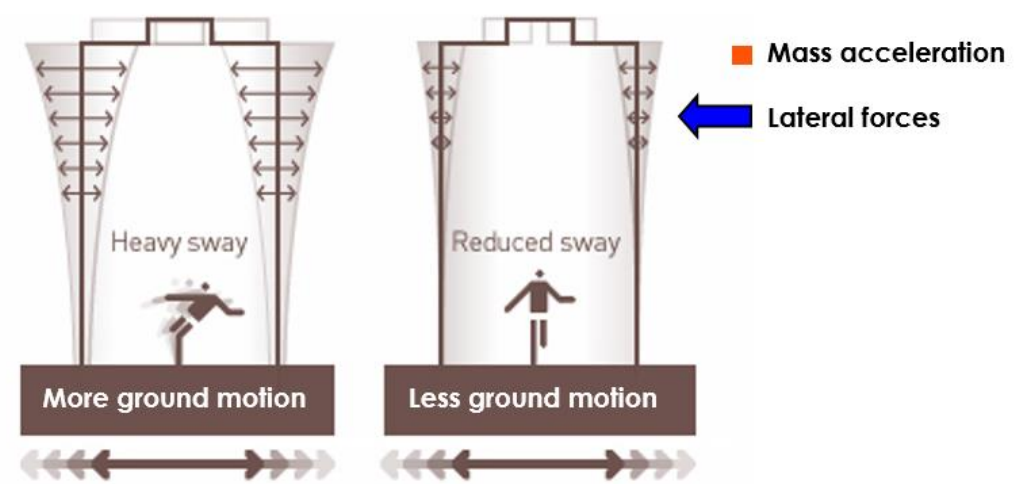
Acoustic Score: Rw 46



INTRODUCTION TO AAC

The light weight of AAC improves the earthquake resistance of a building

- Earthquakes are devastating events that result in human life and proprietary losses. Many building collapses could have been prevented with better design, construction and maintenance¹
- Total building mass, design symmetry (rectangular and circle vs T- or L-shaped) and fire resistance are major contributing factors to structures performance in seismic areas
- The strong the earthquake, the greater the risk of mass acceleration at the top of the building. The more the building weighs at the top, the more sway it will gain during ground motion³
- Safety of buildings is not created overnight but attention worldwide is focused on the most suitable material of choice and building methods for new and retrofitted units²
- AAC outperforms many building materials on earthquake resistance: (1) lightweight of AAC allows for lower total building mass; (2) versatility of AAC allows for structural symmetry of buildings and less deformation stress; (3) AAC is non-combustible and has high fire resistance providing advantages in case of fires, commonly associated with earthquakes
- There are no restrictions within the International Building Code on the use of AAC elements.
- Countries with historically high seismic activity (e.g. Japan, New Zealand, Chile) all have successfully adapted AAC-based buildings



Source: Xella USA presentation, 2010 (images below and above).

Seismic Design Categories (SDC) Classifications:

	A	B	C	D	E	F	
■ AAC Floor Panels	●	●	●	●	●	●	Suitable
■ AAC Wall Panels	●	●	●	●	●	●	Suitable
■ AAC Roof Panels	●	●	●	●	●	●	Suitable
■ AAC Blocks (Hybrid)	●	●	●	●	●	●	Suitable
■ AAC Blocks (Infill Only)	●	●	●	●	●	●	Suitable
■ AAC Blocks (Lateral Force Resistant System)	●	●	●	●	●	●	Calculate

Source: ¹ and ⁴Hebel Design Analysis Program, 2002; ²SASS Handbook, 2003; ³Xella USA presentation, 2010

ENERGY EFFICIENCY

- AAC is considered a sustainable building product because of its **excellent insulating qualities** resulting in **increased energy efficiency**
- Due to its porous structure AAC has very low thermal conductivity / **high thermal resistance**
 - Research shows an R-value of AAC (200mm wall) of 1.54, 5x more than solid concrete (R-value 0.3 for 200mm wall)¹
 - Higher thermal values immediately **increase energy savings** and comfort levels
- **Minimum air leakage:** AAC structures have integrated insulation, preventing thermal bridging
- AAC buildings minimizing uncontrolled air changes and maximize the efficiency of heating / Air Conditioning equipment

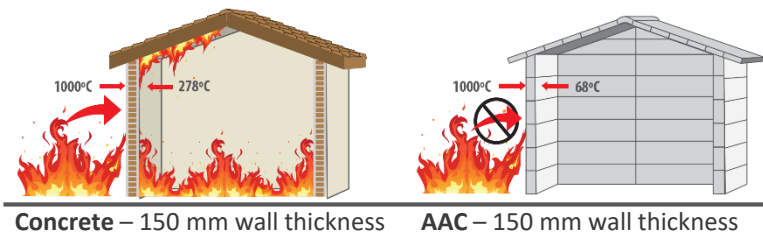
DURABILITY

- AAC is a strong, inorganic, non-toxic, and does not shrink, rot, warp, corrode, and is termite and mold resistant
- This extreme durability makes the product virtually maintenance free, eliminating the need for repair materials, pesticides, and chemical treatments

FIRE & RESISTANCE

- AAC building systems offer the best fire safety available
- AAC has proven to remain fully intact and withstand the stress of **fire for up to 4 hours** without any impairment to its stability. Even under intense heat, AAC remains tightly sealed against smoke and gas, emitting no toxic fumes

Thermal Conductivity refers to the property of a material to conduct heat. In the construction industry the thermal **resistance** value is used. This is inverse of thermal conductivity: the higher the R-value, the better the insulation properties of a building material.



Time	Temperature C° of Exterior Walls		
	AAC	CMU	Wood Frame
0min	Start Time		
15min	29.4	29.4	54.4
20min	33.9	70.0	105.0
25min	32.2	71.1	152.8
30min	32.8	55.0	Failure
35min	32.2	37.8	
40min	31.1	37.8	
45min	28.3	Failure	

Source: <http://www.hebel-usa.com>

¹http://web.archive.org/web/20130426212920/http://www.sustainability.vic.gov.au/resources/documents/Insulation_types.pdf

SECTION 2

AIRCRETE PRODUCT APPLICATIONS



AAC is the most suitable building material for **sustainable and fast construction in Brazil**. The extensive product portfolio and outstanding material characteristics create the perfect foundation for modular, fast and eco-friendly housing solutions which outperform traditional building materials.



AAC offers flexible and sustainable building application

The excellent thermal insulation properties make AAC the building material of choice in the hot and humid climate of Brazil. AAC can be used as load-bearing material alone (in form of reinforced panels) or as a complement to the existing concrete and steel structures



AAC to address real estate boom and housing shortage

The Brazilian real estate sector continues to grow rapidly. AAC Blocks and Panels allow for cost-effective and fast construction (up to 50 m² per worker per day), reducing installation, insulation and foundation costs while improving the delivery timelines



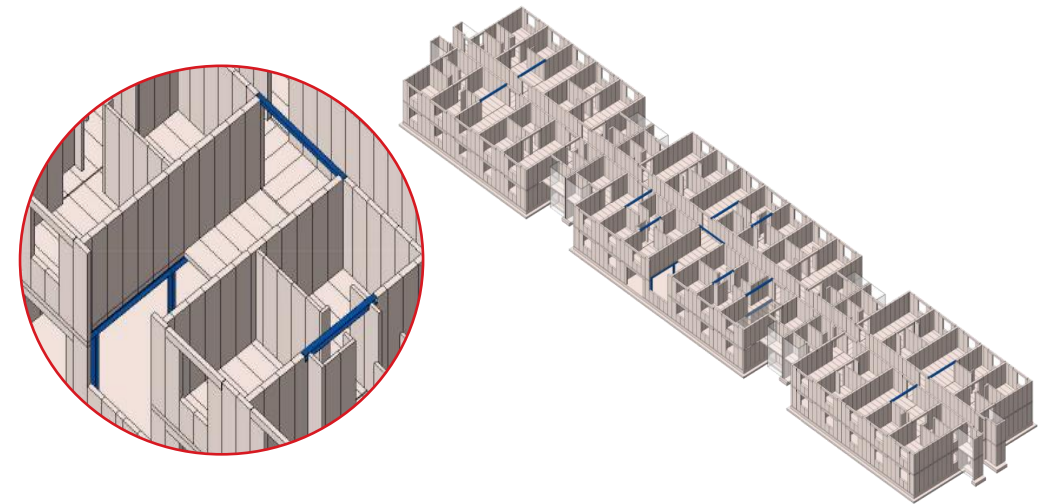
AAC is an established building material in South America

AAC has a long history in South America and has proved to be a competitive building material in the South American region. Furthermore, there are numerous AAC block-making plants in South America itself, opened in the last 5 years, indicating key market acceptance



Opportunity to get first-mover advantage with AAC panels

While South America has embraced prefabricated AAC, the use of AAC products in Brazil, specifically panels, is currently very limited. Based on local production of AAC, Aircrete Building System could be an extremely competitive and fast solution to address the Brazilian housing shortage. It will meet green building codes, have better life-cycle economics and ensure the high quality housing for better protection against natural disasters



Example of a building design, based on the Aircrete Building System. Steel beams (marked blue) are the only non-AAC elements in this 4-storey building

Source: Aircrete

Minha Casa, Minha Vida

My Home, My Life¹

The *Minha Casa, Minha Vida* (MCMV) program, currently the main and sole channel for social housing production, was established in 2009. The program has effectively delivered impressive numbers of affordable housing units, reducing the

country’s historical housing deficit, with more than 4.5 million units distributed to the population. However, it has also received *negative reviews and criticism for the planning, design, and quality of its end products.*

The program still requires participation and improvement¹

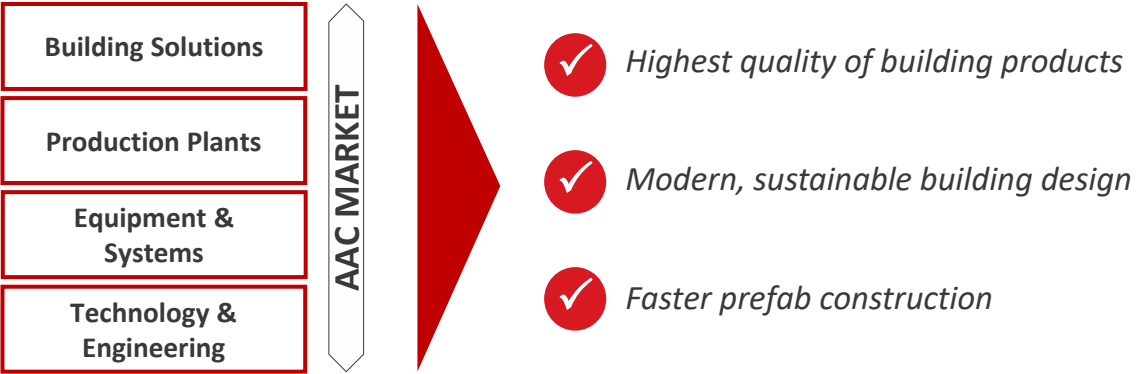
In Rio de Janeiro, for example, 53 per cent of the MCMV units delivered between 2009 and 2013 were built in the far-off West Zone, 50 km from the city center.

Residents living in the West Zone are up to four hours and multiple transfer fees away from areas of employment and from the centers of urban resources in downtown and the South Zone.



Aircrete Building System as a next step of MCMV!

Aircrete Europe’s integrated market approach allows for reaching the entire AAC market:



BLOCKS

Durable and resistant, AAC blocks provide excellent thermal and acoustic insulation, structure and fire protection in one lightweight product.



LINTELS & U-BLOCKS

Aircrete lintels are special load-bearing reinforced products. They serve as beams to support the weight of the wall over window or door openings.



WALL PANELS

External wall and internal partition panels are the main elements of Aircrete Building System for fast and cost effective building requirements.



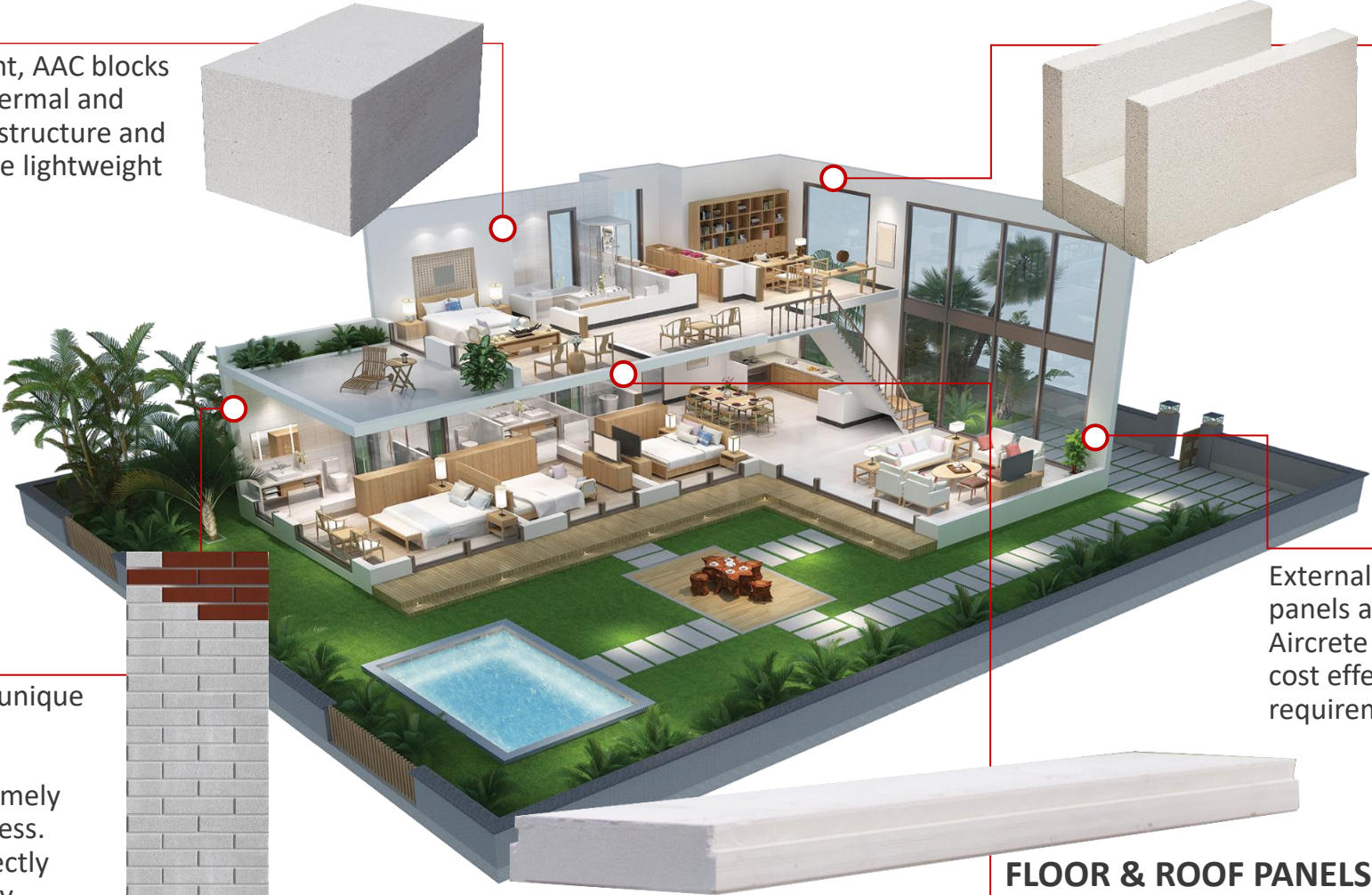
CLADDING PANELS

Aircrete cladding panels are unique AAC products for façade applications. The product is reinforced but remains extremely light due to 35-50mm thickness. Panels are suitable to be directly applied on the exterior of any building.

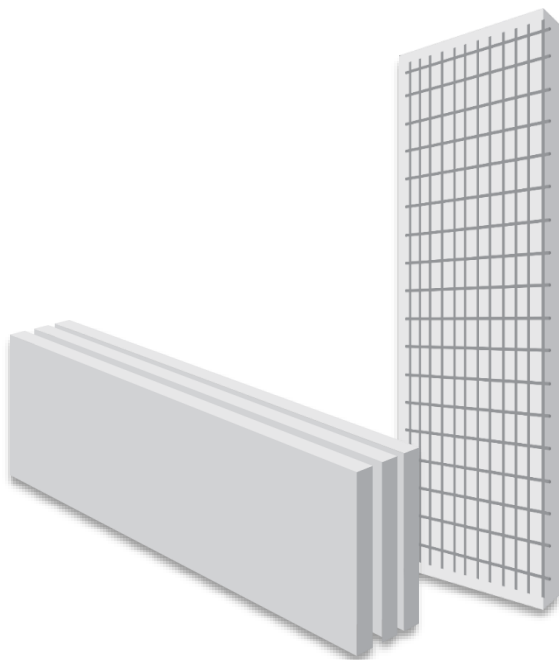


FLOOR & ROOF PANELS

Lightweight floor/roof panels are load-bearing elements, used in residential and commercial constructions.



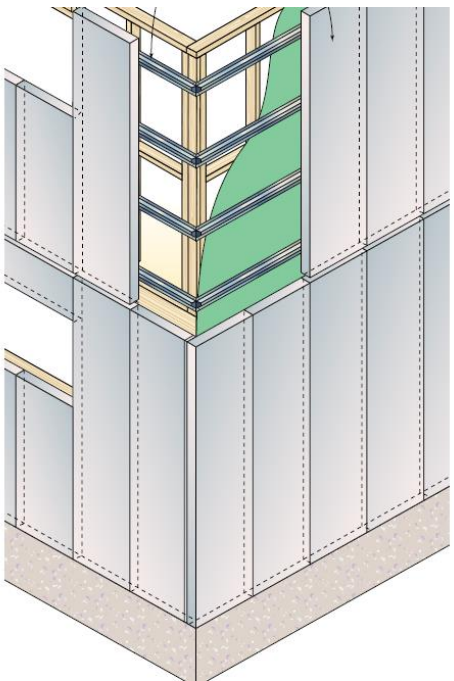
THIN WALL AND CLADDING PANELS
(Horizontal and vertical application)



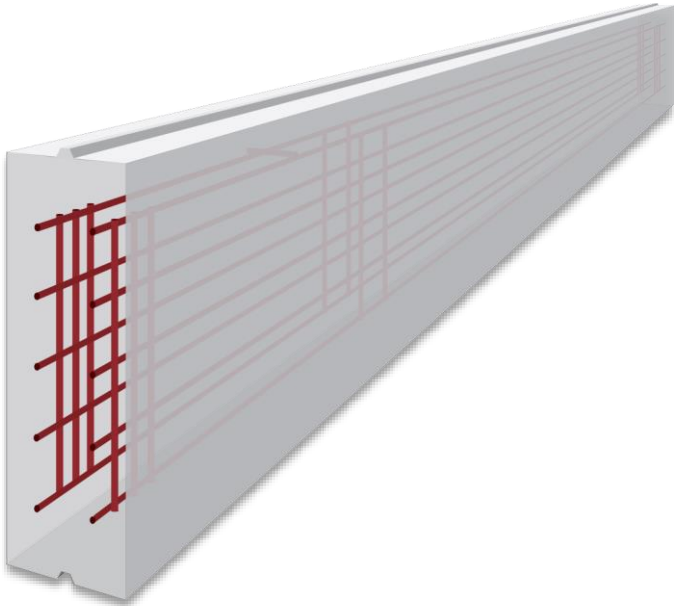
Product specifications

Length	2,000 – 6,000mm
Height	600 – 625mm
Thickness	50 – 100mm
Accuracy	± 1.0 – 3.0mm (EN12602 / ASTM 1694-09)
Reinforcement	Light steel grid (non-structural)
Profiling	N/A
Density range	500 – 800kg/m ³
Surface	Option of Super Smooth

INTERNAL PARTITIONING AND EXTERNAL CLADDING (FAÇADE) SOLUTION



LARGE WALL PANELS
(Horizontal and vertical application)



Product specifications

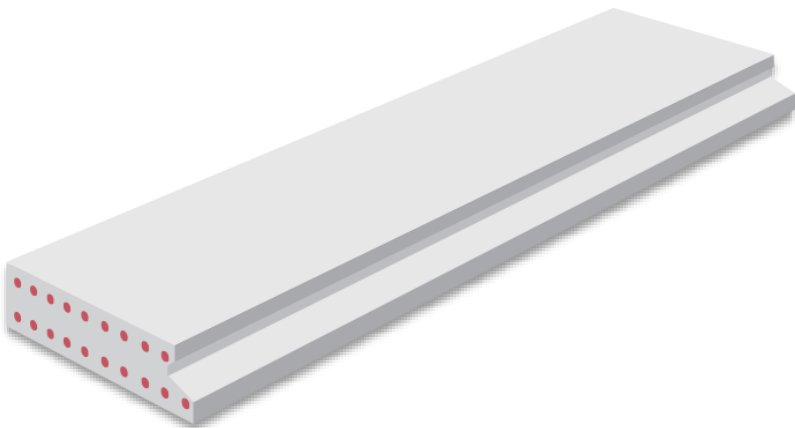
Length	1,000 – 6,000mm
Height	300 – 625mm
Thickness	75 – 300mm
Accuracy	± 1.0 – 3.0mm (EN 12602 / ASTM 1694-09)
Reinforcement	Heavy steel grid (structural)
Profiling	Tongue & Groove, Bevel, Square, Recess
Density range	500 – 600kg/m ³
Surface	Option of Super Smooth

INSTALLATION OF LARGE WALL PANELS



ROOF & FLOOR PANELS

(purposes in residential, commercial and industrial applications)



Product specifications

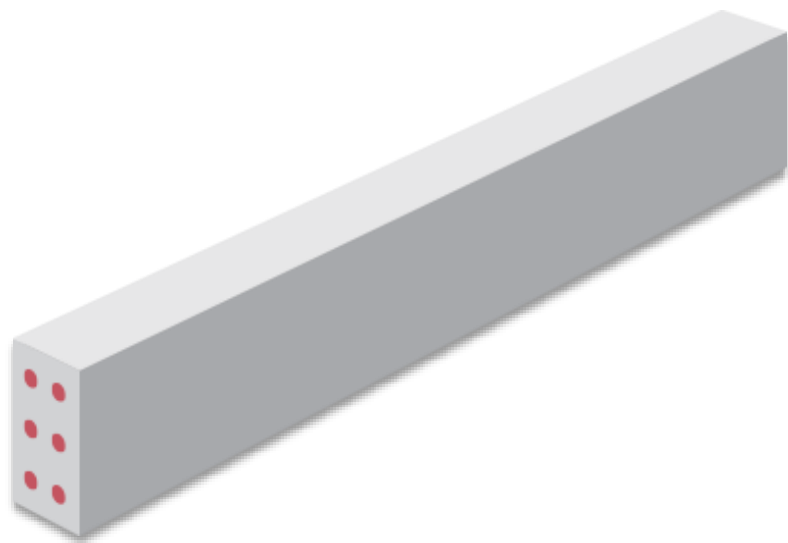
Length	1,000 – 6,000mm
Height	300 – 625mm
Thickness	150 – 300mm
Accuracy	± 1.0 – 3.0mm (EN 12602 / ASTM 1694-09)
Reinforcement	Heavy steel grid/cage (structural)
Profiling	Tongue & Groove, Bevel, Square, Recess
Density range	500 – 600kg/m ³
Surface	n/a

INSTALLATION OF FLOOR AND ROOF PANELS



STRUCTURAL LINTELS

(supporting the load over window or door openings)

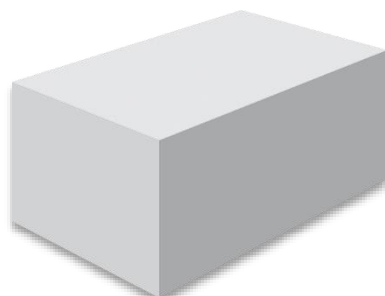


Product specifications	
Length	500 – 2,500mm
Height	250mm
Thickness	100 – 300mm
Accuracy	± 1.0 – 3.0mm (EN 12602 / ASTM 1694-09)
Reinforcement	Cage (structural)
Profiling	n/a
Density range	400 – 600kg/m³
Surface	n/a

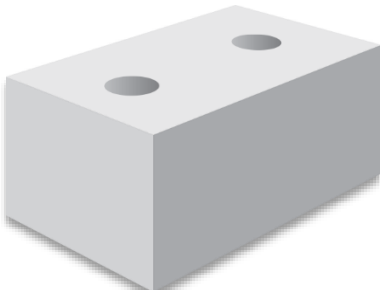
INSTALLATION OF STRUCTURAL LINTELS



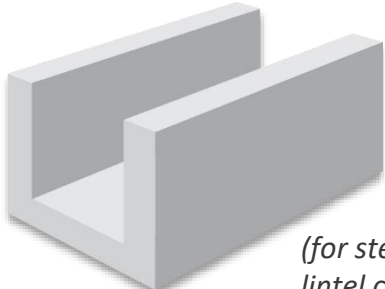
BLOCKS



(For internal, partitioning and external wall in-fill)



(For flexible introduction of steel rebar on the corners)



(for steel reinforced beam lintel column)

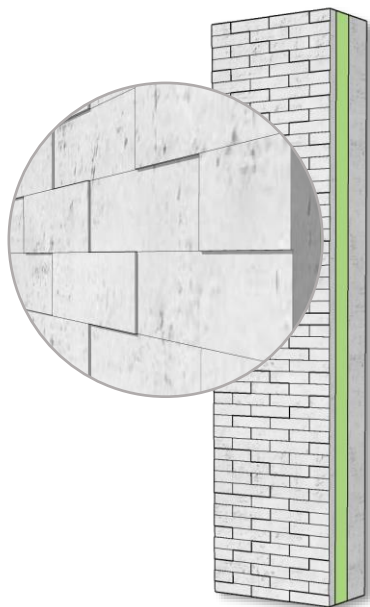
Product specifications	
Length	500 – 625mm
Height	200 – 400mm
Thickness	50 – 300mm
Accuracy	± 1.0 – 1.5mm (EN 771-4 / ASTM C1691)
Reinforcement	n/a
Profiling	n/a
Density range	350 – 600kg/m ³
Surface	Option of Super Smooth

INSTALLATION OF BLOCKS



SANDWICH PANELS

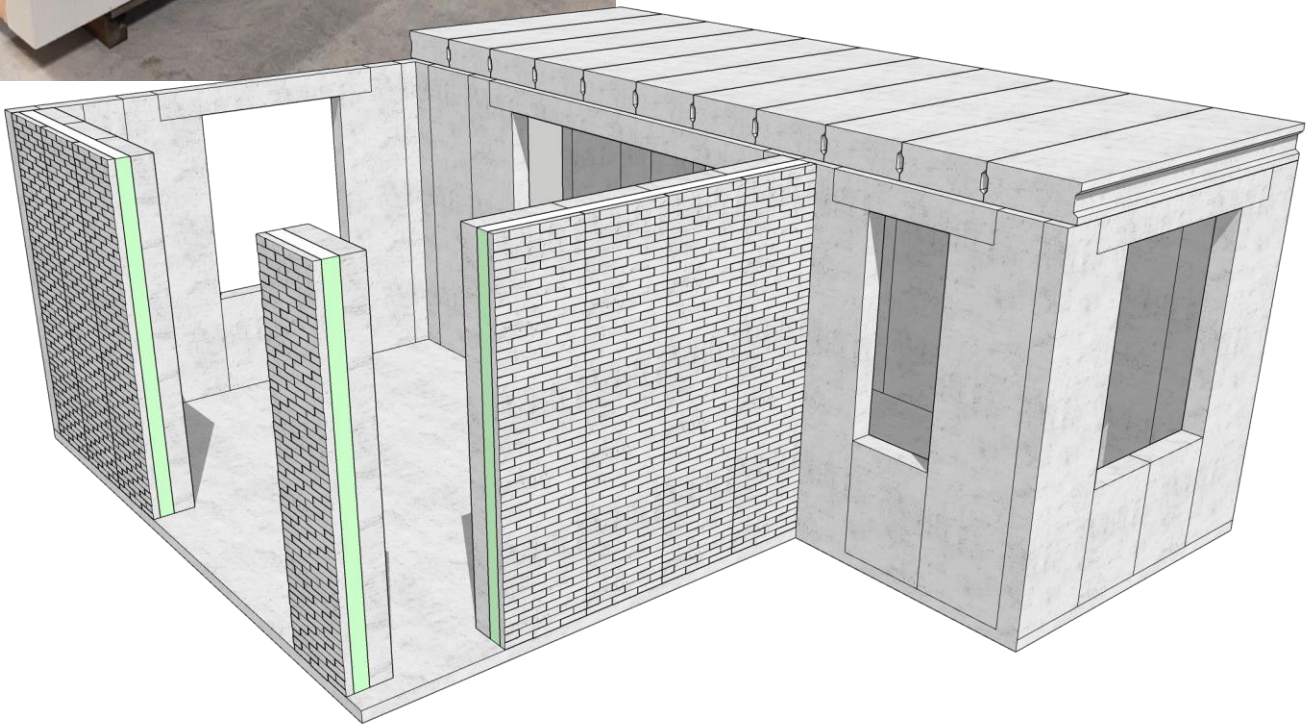
(Horizontal and vertical application)



Product specifications

Length	1,800 – 3,000mm
Height	600mm
Thickness	Inner wall: 100 – 200mm Insulation: 50 –150mm Outer wall: 50 – 100mm
Reinforcement	Inner wall: (non) structural Outer wall: non strucural
Profiling	N/A
Density range	500 – 800kg/m ³
Surface	Inside: Option of Super Smooth Outside: Option of routing

SANDWICH PANEL SOLUTION





Installation of industrial wall panels



Building with the Aircrete Building System



Installation of AAC wall panels



Installation of industrial wall panels



Installation of industrial wall panels



Finishing works



Installation of AAC wall panels



Installation of industrial wall panels



Installation of levelling blocks



Installation of wall panels



Overview of building



Installation of floor/roof panels



Overview second floor



Overview



Installation of roof panels



Installation of roof panels



Installation of roof panels



Finishing works



Finished building

AIRCRETE PRODUCT APPLICATIONS

Installation process – Industrial wall panels



Placing level blocks



The space between the foundation and panel is filled with cement



Glueing of the panel



Transporting the panel by crane to installation



Installation team of two people



Installation of the panel



Fill up the anchor spaces with foam



Anchor to attache the panel to the steel frame



Continue with the rest of the panels



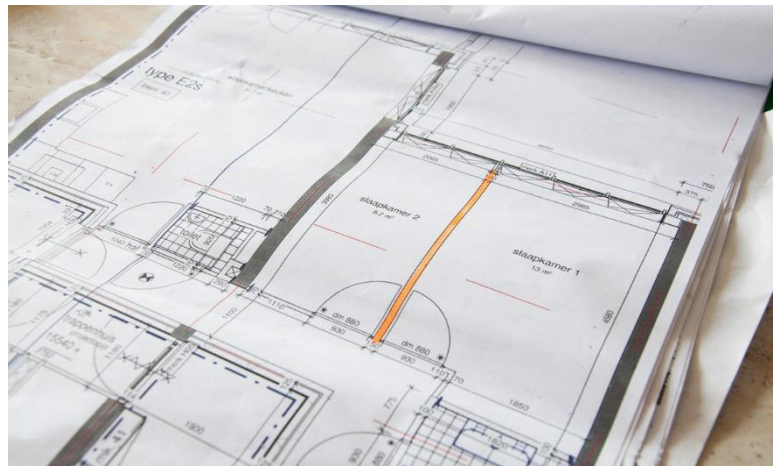
Inside of the building



Installation of wall panels

AIRCRETE PRODUCT APPLICATIONS

Installation process – Partition panels



Drawing that shows the partition wall with dimensions



Draw the layout of the wall on the ceiling with a chalk line



Use a panel lifting car to take the panels from the pallet



Place two rubber blocks on top of the panel, used for dialation



Push the panel in vertical position and move it in position



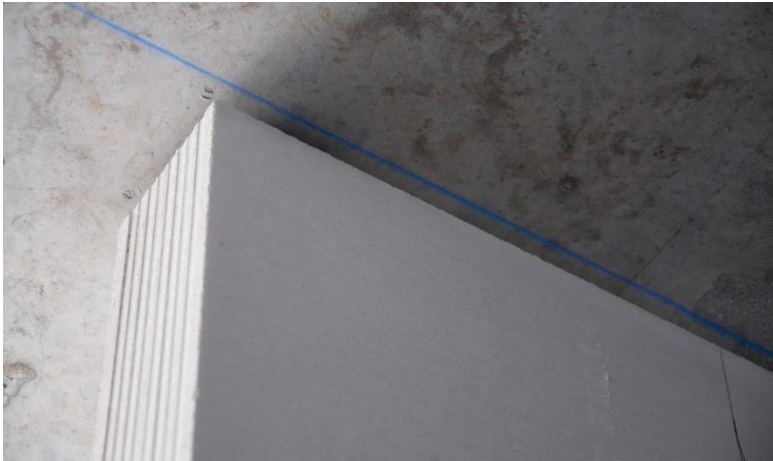
Use a panel bar to move the panel slowly



Align the panel with the previous panel(s) and the chalk line



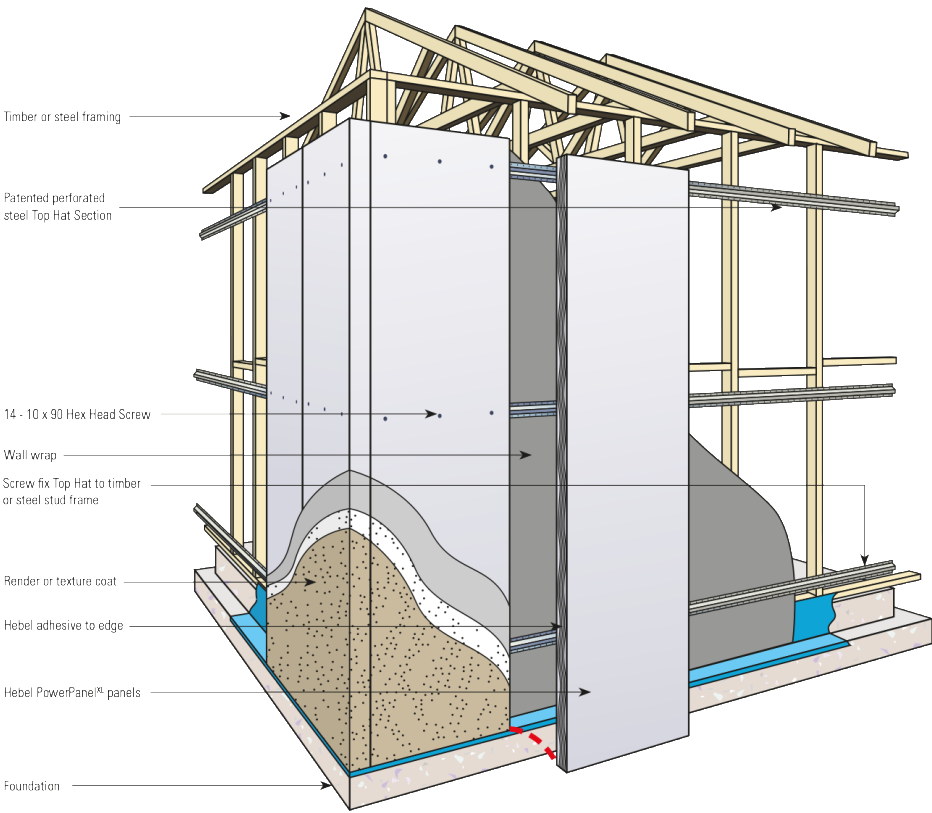
Level the panel vertical and horizontal



Aligned with the chalk line



Ready partition wall, after finishing works

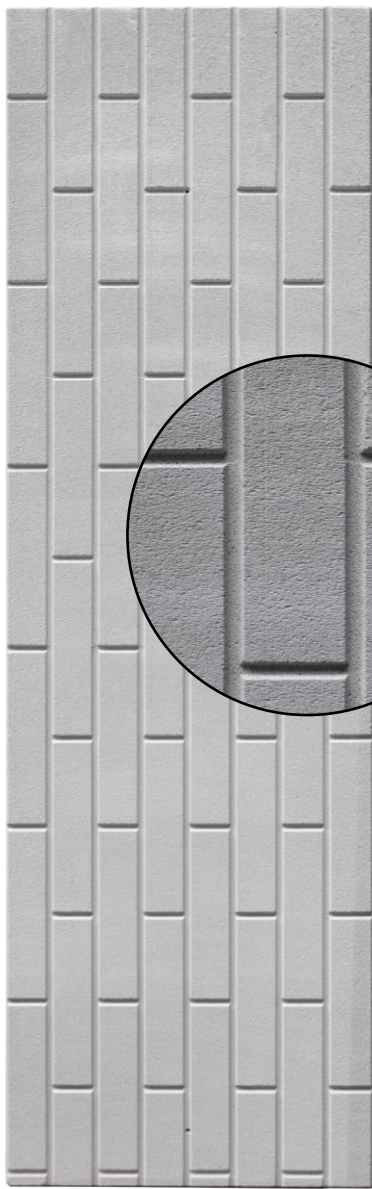
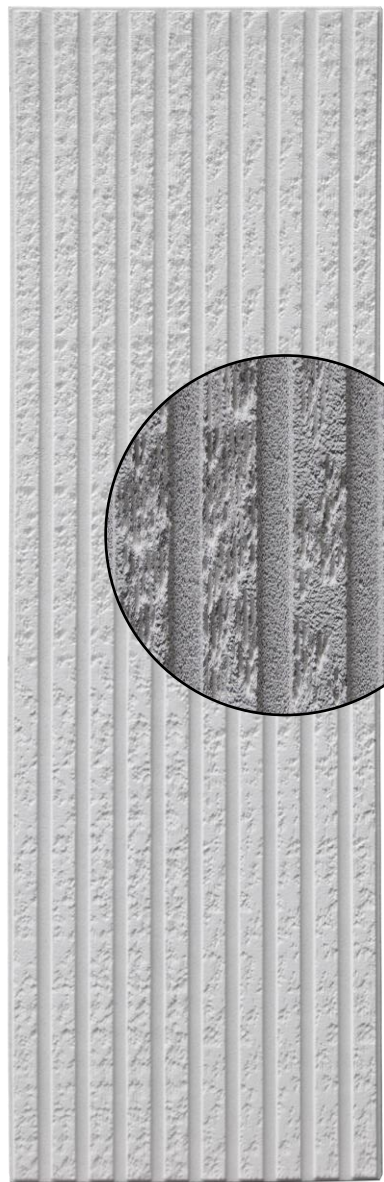


AIRCRETE PRODUCT APPLICATIONS

Thin panels on timber frame









AIRCRETE VIDEO:

Single-family house project in the Netherlands
<https://youtu.be/--kaM73yWCY>



AIRCRETE VIDEO:

Installation of an industrial wall, part 1/3
<https://youtu.be/kHClyMLsWnE>



AIRCRETE VIDEO:

Installation of an industrial wall, part 2/3
<https://youtu.be/fYogUJ4oNS0>



AIRCRETE VIDEO:

Installation of an industrial wall, part 3/3
<https://youtu.be/qUvBSLfcGJI>



MERHIS VIDEO:

An Australian company on high rise building with steel & AAC
https://www.youtube.com/watch?v=C7mCHC_DLVO



CSR HEBEL (AUSTRALIA):

AAC application downloads
<http://hebel.com.au/document-library-by-application-list>



MALAYSIA & SINGAPORE:

All-in cost comparison building with AAC page
http://premium-aac.com/products_costsavingchart.html



AIRCRETE BROCHURE:

The Aircrete Building System
<http://www.aircrete-europe.com/images/download/en/Aircrete%20Building%20Solution.pdf>

SECTION 3

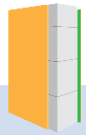
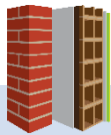




GLOBAL BUILDING COST COMPARISON



GLOBAL BUILDING COST COMPARISON

AAC outperforms traditional building methods in Latin America | Argentina comparison



	<div>I</div> <div>AAC</div> <div>15cm</div> <div></div>	<div>II</div> <div>SANDWICH WALL</div> <div>12cm + 12cm (hollow)</div> <div></div>	<div>III</div> <div>HOLLOW WALL</div> <div>12cm + 8cm</div> <div></div>	<div>IV</div> <div>HOLLOW WALL</div> <div>18cm</div> <div></div>	<div>V</div> <div>SOLID WALL</div> <div>15cm</div> <div></div>	<div>VI</div> <div>SOLID WALL</div> <div>30cm</div> <div></div>
COMPARABLE METRICS						
Price (ARS/m²)*	\$1,196	\$1,617	\$1,473	\$1,201	\$1,199	\$1,782
Thermal resistance (W/m²*K)	1,4	0,7	1,4	0,65	0,35	0,58
Weight (Kg/m²)	110	350	260	285	250	515
Installation time (hr/m²)	2,48	4,00	3,7	3,00	3,00	4,25
Local building code compliant¹	✓	✓/x	✓	x	x	x

AAC is significantly cheaper per installed m² (material and manual labor). Prices include masonry product + labour, reinforcement, plaster & rendering + labour.

NB: prices exclude the savings in structural steel and concrete required

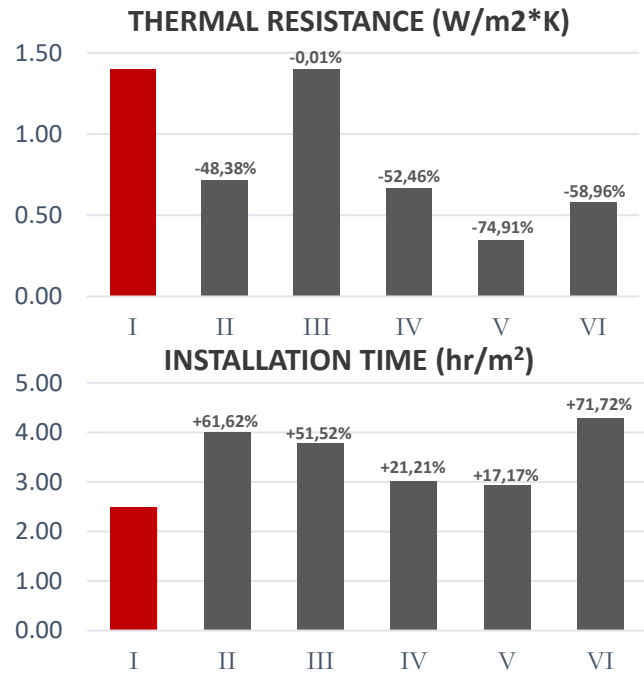
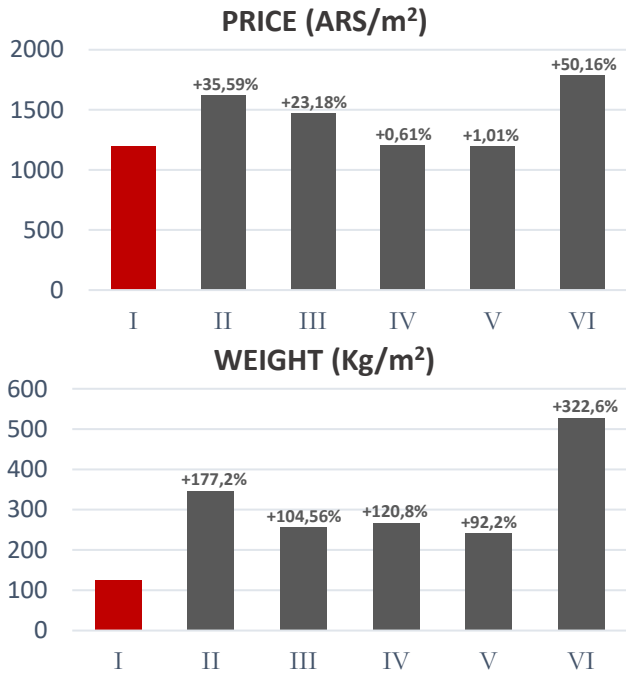
The lower weight compared to alternatives in the market allows for faster construction

Source: Brimax S.R.L. (Argentina)

¹ Based on Argentina Ley 13059 / IRAM 11605

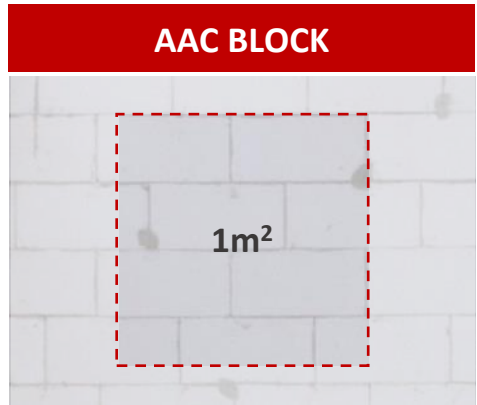
* 1EUR = ARS 16.0923 (14 April 2017)

Attn.: [CLIENT NAME]



On thermal resistance, AAC outperforms most currently present alternative building materials in the market

With respect to Installation time per m² installed, AAC is the fastest available option in the market



15% CHEAPER



232 ZAR
Per 1m²

8X LARGER PIECE SURFACE



6.6 BLOCKS
Per 1m²

3X FASTER CONSTRUCTION

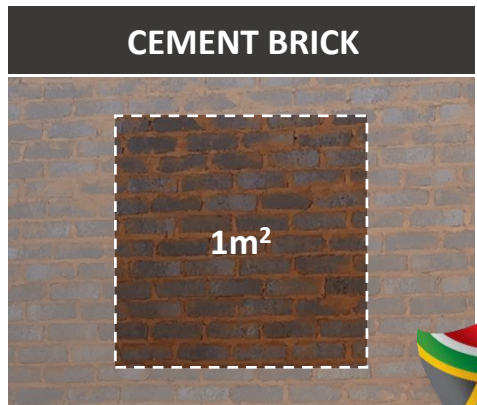


16 MINUTES
Per 1m²

2X LIGHTER WEIGHT



95kg
Per 1m²



272 ZAR
Per 1m²



55 BRICKS
Per 1m²




48 MINUTES
Per 1m²

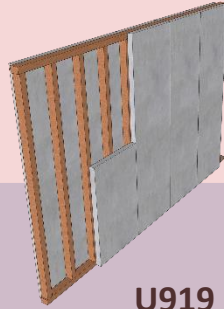
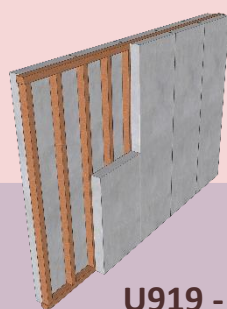
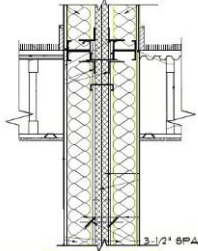
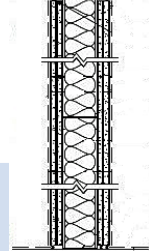
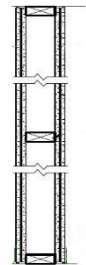



200kg
Per 1m²







	AAC 3"		AAC 4"		Gypsum Board 1" + 1/2"		Gypsum Board 5/8"		Gypsum Board 15cm	
	<div><div>I</div><div></div><div>U919 - 3"</div></div>		<div><div>II</div><div></div><div>U919 - 4"</div></div>		<div><div>III</div><div></div><div>U336</div></div>		<div><div>IV</div><div></div><div>U411</div></div>		<div><div>V</div><div></div><div>U301</div></div>	
COMPARABLE METRICS										
Material	3" x 48" x 24" blocks		4" x 24" x 9 ft panels		(2x) 1/2" external layers + (2x) 1" internal layers		(4x) 5/8" external layers		(4x) 5/8" external layers	
Insulation	-		-		Batts and Blankets		Batts and Blankets		2x wood stud wall	
UL Fire Rating	2 hours		4 hours		2 hours		2 hours		2 hours	
Wet environment proof (mold)	✓		✓		✗		✗		✗	
Single inspection	✓		✓		✗		✗		✗	
Completaly non-combustible	✓		✓		✗		✗		✗	
Thermal Efficiency	1 2 3 4 5		1 2 3 4 5		1 2 3 4 5		1 2 3 4 5		1 2 3 4 5	
Assembly Speed	1 2 3 4 5		1 2 3 4 5		1 2 3 4 5		1 2 3 4 5		1 2 3 4 5	
Material cost (USD/ft²)	\$ 2.11		\$ 2.95		\$ 4.10		\$ 4.67		\$ 4.10	
	<div><div></div><div>Remove Fire Walls from Critical Path!</div></div>									

Source: Aercon AAC / UL

Source: Aercon AAC / UL

SECTION 4

SELECTION OF REFERENCE PROJECTS



PROJECT HIGHLIGHTS

- Project Type: Nebra Tower Residential Apartments (high-rise)
- Location: León Guanajuato, Mexico
- Products: **Aircrete Partition Panels (SUPER SMOOTH)**
- Product details: Density 600 kg/m^3 – L=2.85m, W=0.6m, Thickness=75mm (3") and 100mm (4")
- Install time: **40 – 60m² per 7.5hrs with 1 worker**
- Competition: Ceramic Brick, Gypsum Board (Drywall)



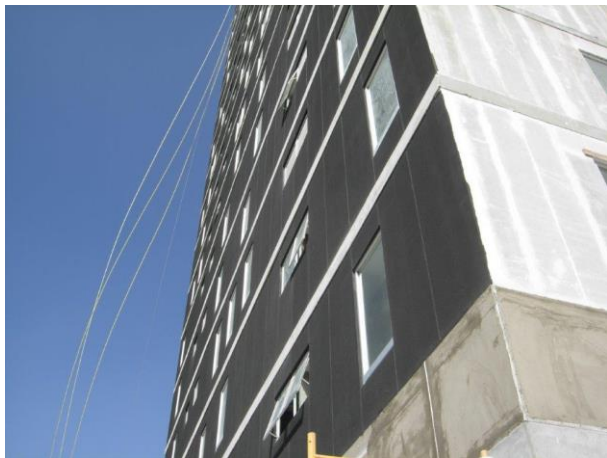
PROJECT HIGHLIGHTS

- Project Type: Cosmocrat Towers Residential Apartments (high-rise)
- Location: Mexico City, Mexico
- Products: **Aircrete Partition Panels (SUPER SMOOTH)**
- Product details: Density 600 kg/m^3 – L=2.85m, W=0.6m, Thickness=75mm (3") and 100mm (4")
- Install time: **40 – 60 m² per 7.5hrs with 1 worker**
- Competition: Ceramic Brick, Gypsum Board (Drywall)



PROJECT HIGHLIGHTS

- Project Type: Torre de Departamentos Residential Apartments (high-rise)
- Location: Monterrey, Mexico
- Products: **Aircrete Partition Panels (SUPER SMOOTH)**
- Product details: Density 600 kg/m³ – L=2.85m, W=0.6m, Thickness=75mm (3”) and 100mm (4”)
- Install time: **40 – 60 m² per 7.5hrs with 1 worker**
- Competition: Concrete Hollow Block, Ceramic Brick, Precast Concrete panel



PROJECT HIGHLIGHTS

- Project: Sordo shopping mall
- Type: Commercial (shopping mall)
- Products: AAC4 Blocks
- Location: Mexico City, Mexico



Complete urban centers, totaling over 40.000 units, have been built by KORA Angola in the last 5 years

Today Kora continues to develop similar projects in the provinces of Bie, Huambo, Kuanza Sul, Moxico, Uige and Luanda in Angola.

Project Details – Urban Centrality of Kuito (imported from the Netherlands)

Location	:	Kuito, Bie province, Angola
Goal	:	Affordable Urban Centralities Creation
Type of Housing	:	Single-story houses/Duplex houses/3-story apartments/Stores
Size of Housing	:	3-bedroom houses (100m ²)/3-bedroom apartments (100m ²)
Project Size	:	6000x units

Project Milestones – Single 4-story Apartment Housing (800m² of livable space)

Phase I	:	4 weeks (Suitable Building Solution & Total Project Financials)
Manufacturing	:	10 weeks (in the Netherlands)
Transport to Angola	:	3 weeks
Installation on-site	:	3 days (building envelope only i.e. ready for finishing)

Using Aircrete Building System has effectively minimized the building material needs and has significantly contributed to a lower overall cost of construction in Angola, thereby making this Angolan Social Housing affordable to all.



Apartment
Size: 100m²

- 3 Bedrooms
- 2 Bathrooms
- 1 Kitchen
- 1 Living room
- 1 Laundry



Courtesy of: KORA Angola

*Masterplan of
the Kuito
centrality*



*Ready for
outside finishing*



*Finalised
building
envelope and
start of finishing*



*Construction
under way*



Courtesy of: KORA Angola



innovation built on experience

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