

# AIRIUM®

## Insulation Redefined

TOP TIER INSULATION FOR SUSTAINABLE BUILDINGS



A TECHNOLOGY OF  
 **HOLCIM**

# AIRIUM® – MINERAL FOAM INSULATION

Improving the energy efficiency of buildings is among the biggest challenges of the 21st century. Approximately one-third of global energy consumption is currently used for heating and cooling buildings. Buildings generate close to 30% of global green-house gases during their use phase.

Holcim's answer is Airium®, a mineral foam insulation and lightweight filling technology range that improves the energy efficiency of buildings and simplifies construction systems and processes, from wall to wall and from floor to ceiling.

Depending on the chosen density, Airium® can be used as a:

- Non-structural highly efficient mineral insulation alternative
- Walkable, levelling/sloping and insulating layer in floors and roofs
- Lightweight easy to use alternative in filling and geotechnical applications

#### How does it work?

Airium® is made of a cement-based slurry, aqueous foam and mostly... enclosed and distributed air bubbles! It is the first mineral foam to offer a top-tier insulating performance, for an ideal thermal comfort, be it for cold temperatures or heat peaks. Being mineral, it is also fully fire-resistant, completely recyclable, unfavorable to insects or rodents and it contains no added chemicals. Airium® is also very easy to use, increasing the speed on jobsites and tightly filling any corner or shape. It also boasts the best consistency to make sure you get the same foam every single day.

It is produced on site using different tailor made and industrially proven equipment: reach out to us to know what operational model is more adapted to your needs.



#### Living with Airium®: For healthy and safe insulation solutions

Rising energy bills, swings in room temperature, risk of fires or environmental impacts: these are top of mind issues that Airium® based systems can address

Airium® is an insulation alternative which brings comfort and peace of mind. Our revolutionary material is:

- **Effective:** helping you deal with temperature changes and acoustics with no loss of performance over time.
- **Healthy and safe:** chemical-free with optimal fire protection: A1 per EU standards.
- **Sustainable:** long lasting insulation, mineral, low carbon intensity.



#### Building with Airium®: Go faster and avoid unnecessary hassle

Meeting tight schedules and regulatory targets, optimizing operations and margins whilst ensuring the health and safety of workers: all well-known struggles for builders and contractors.

Airium® can make life on jobsites easier when it comes to insulation. It is:

- **Efficient:** build and insulate at the same time, Airium® simplifies construction systems and job site processes.
- **Hassle-free:** reduced transportation, storage and handling needs, as Airium® is produced on site and pumped from the ground.
- **Easy to use:** flexible and adaptable material.

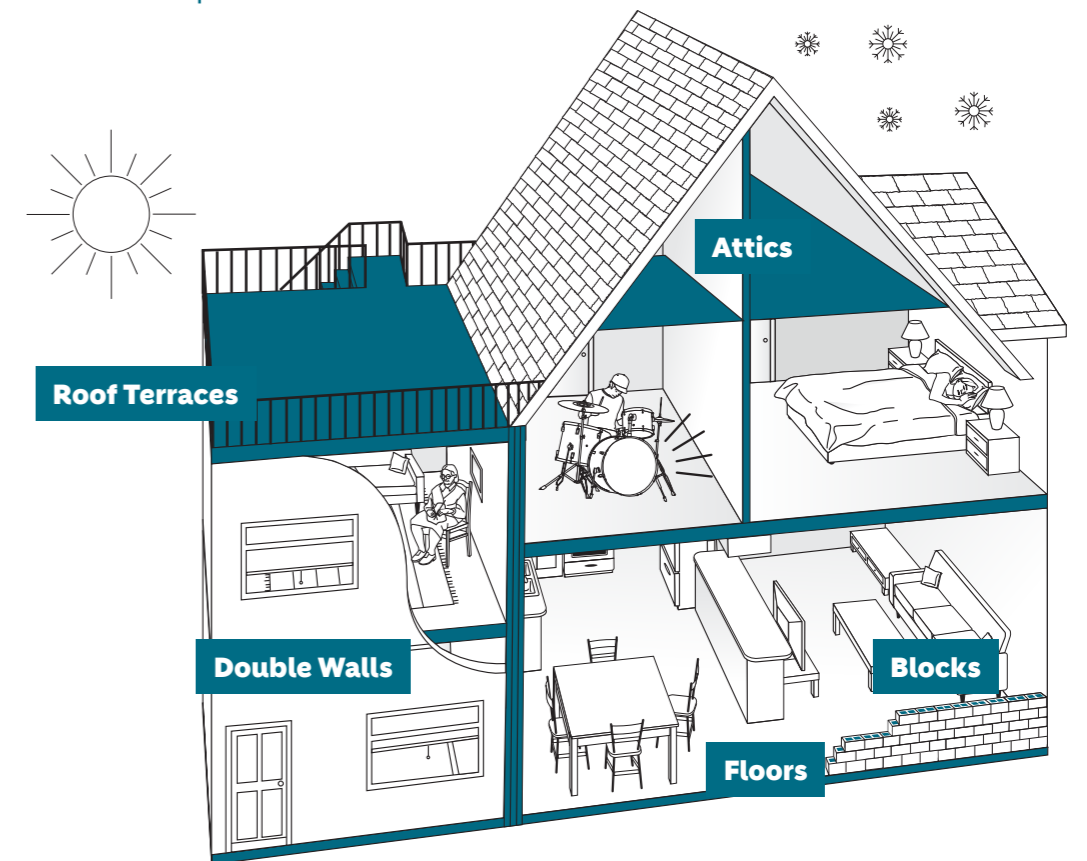


#### Designing with Airium®: Choose a local, mineral, long-lasting solution

Reaching ambitious energy efficiency targets in a sustainable way is key in any building design.

Airium® provides insulation that is:

- **Ecological:** easy to recycle, stable performance over time, may decrease deadload and CO<sub>2</sub> intensity per square meter (to be looked at at system level)
- **Healthy:** fire resistant, no VOCs and mold-free.
- **Durable:** lasts long like concrete.



# AIRIUM®: A TECHNOLOGY PLATFORM BRINGING VALUE IN MULTIPLE CONSTRUCTION SYSTEMS

Airium® is a technology platform with infinite possibilities in both the insulation and in the lightweight filling spaces. See in this section the different applications where Airium® brings value. Contact us with your needs and your ideas: we believe the way forward is through true partnerships; your insights are crucial for us to make the most of Airium® on existing applications and, why not, to uncover many more applications of Airium®.



The approach of our team is pragmatic. We work in a collaborative way, adapting existing Airium® experiences to your own project specificities and co-developing new systems and applications with Airium® inside.

## Applications of Airium®

- Floors:**
- Insulating layer below screeds in intermediary floors
  - Sub-slab
  - Direct screed at higher densities

- Walls:**
- Filled concrete blocks
  - Filled precast wall panels

- Roofs:**
- Roof terraces
  - Attics
  - Precast roofing element

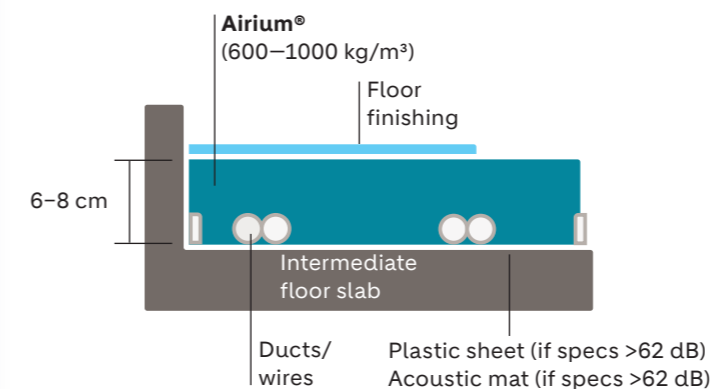
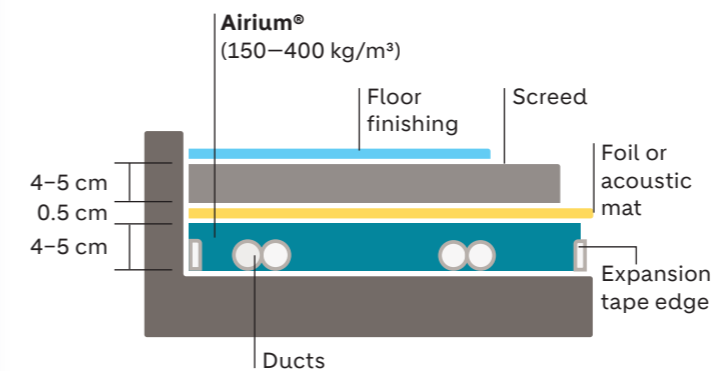
- Lightweight filling:**
- Utilities
  - Geotechnical projects
  - ...

## Floors with Airium®

### Main uses

Airium® in floors can be used in different ways and can be adapted to fit local norms and systems:

- as a sub-screed layer in ground floors or intermediary floors (150 to 400 kgs/m<sup>3</sup>) for a great level, easily covered ducts and pipes and a contribution to thermal performance
- as a sub-slab insulating material replacing both insulation and lightweight concrete with no compaction step (250 kg/m<sup>3</sup>)
- as an all-in-one easy to level lightweight screed (600 to 1000 kg/m<sup>3</sup>)



### Main benefits

For developers and investors, Airium® flooring offers durable insulation, a perfect levelling solution, stability over time, and contributes to lower the overall weight per square meter.

For contractors and applicators, Airium® simplifies life on site: no storage, no cutting and placing of boards, no EPS beads flying on site, no crane required to lift materials to higher floors as Airium® is pumped from the ground, no need to get on one's knees to apply the material. Airium® is also very fast to apply (e.g. ~200-300 m<sup>2</sup> in one hour for a 5 cm thickness)

For the planet, Airium® is mineral and easy to recycle along with the slab with no separation phase. By lowering the densities and the deadload of buildings in different flooring systems, Airium® may also contribute to lowering the CO<sub>2</sub> intensity of flooring systems





## Flat roofs with Airium®

### Main uses

In flat roofs, Airium® can be used as an insulating slope (with a density typically of 400 kg/m³). It allows to build and to insulate at the same time and is especially valuable in emerging countries. Airium® is produced out of local ingredients and typically replaces both the insulation material (Polystyrene or Cork for example) and the concrete slope with a layer of 10 to 15 cm. In case of more demanding regulations, Airium® can replace the screed to slope with a lighter alternative while still being combined with other insulation materials.

### Main benefits

For developers, investors and end-users, 12 cm of Airium® 400:

- Yields up to 48% of energy savings in a typical house in Mexico or Algiers for instance, or up to a 5°C celsius difference felt in a house if no cooling is used.
- Provides a continuous insulation with no thermal bridges and no loss of performance over time
- Provides optimal fire resistance
- Helps to reduce the deadload by a factor of 3 to 8 depending on the comparison made, which enables both engineers to optimize structural design for new projects and owners to easily go for renovation works.

For contractors and applicators, Airium® simplifies life on site: less steps to complete the work as Airium® fulfils the insulation and the sloping functions at the same time, no storage, no cutting and placing of boards: Airium® is pumped from the ground (up to 100 meters). A 1 to 2.5% slope is easy to shape with Airium®, though the applicator must be trained and familiar with the technique and the accessories (tripods or laser, metal bars, joints).

For the planet, Airium® is mineral and easy to recycle along with the slab with no separation phase. By lowering the deadload in horizontal applications, Airium® also contributes to lowering the CO<sub>2</sub> intensity per each square meter built.

## Blocks with Airium®

### Main uses

Airium® at a low density (70 kg/m³) can be injected into any masonry block design and shape through an automatic in-plant process: use the empty holes of hollow concrete blocks to give a boost to the energy efficiency of your building at a limited extra cost and with no loss of space.

### Main benefits

For developers and investors, Airium® blocks mean optimizing the thickness of the wall system to meet local thermal regulations while choosing the best-in-class solution for thermal performance, acoustics, fire resistance and summer comfort. Already in use in France, Poland and Austria, Airium® blocks have performances from U = 0.16 to U=0.9 W/m²K.

For contractors and applicators, Airium® blocks do not change the local construction process. In countries like Poland or Austria, Airium® customers have innovated by coming up with a monolithic block meeting the best wall thermal insulation standards with no extra layer.

For the planet, Airium® at low density (70 kg/m³) injected in blocks presents a lower CO<sub>2</sub> intensity profile (26 kg of CO<sub>2</sub>eq/m³). It is mineral and easy to recycle along with the block at the end of life of the building.

### How Airium® compares: (thermal simulation)

Block thickness	U-value without foam	U-value with Airium®
20 cm	1.17 w/Km²	0.53 w/Km²
36 cm	0.35 w/Km²	0.23 w/Km²
50 cm	0.23 w/Km²	0.16 w/Km²



## Attics with Airium®

### Main uses

Airium® is poured into attics on-site with a density and an insulating power adapted to the accessibility needs of the attics (50 to 180 kg/m³).

### Main benefits

It ensures homogeneous and continuous insulation. It is highly fire-resistant, long-lasting, resistant to rodents/insects, with no volatile organic compounds (VOCs) and no risk of mould as Airium® is a breathing material.

## Lightweight filling with Airium®

### Main uses

Airium® can also be used beyond insulation purposes, as a lightweight sustainable alternative for backfilling and void filling applications, from inaccessible areas to trenches, retaining walls, podiums or utilities.

### Main benefits

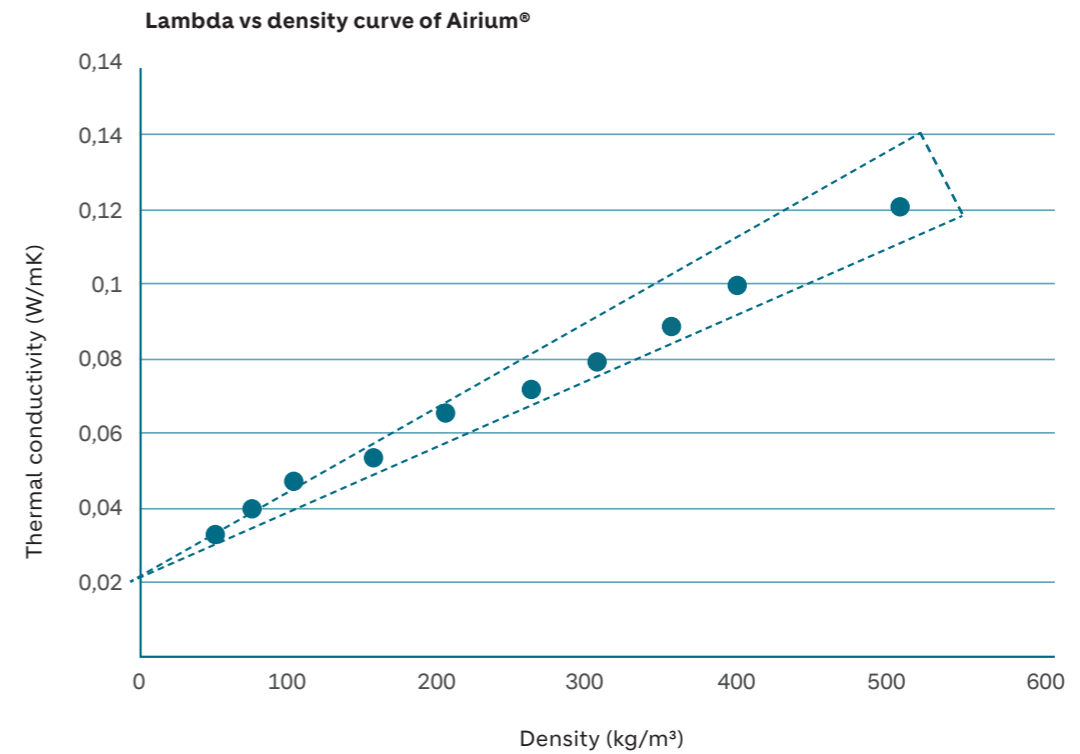
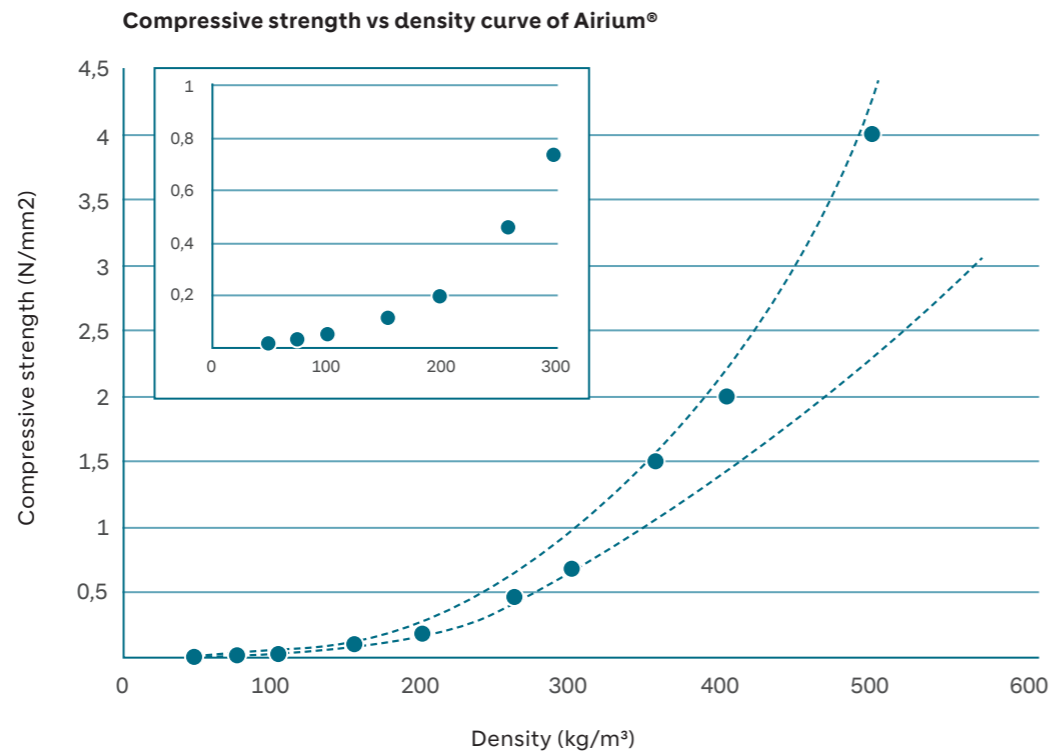
For developers and investors, Airium® flooring does not settle over time, it has low permeability and high fire and heat resistance. It also enables you to reduce weight with the best compromise between lightness and strength.

For contractors and applicators, Airium® is flowable and self-levelling. As Airium® captures the air bubbles on site, it enables considerable logistics and storage savings. Through a compact on site equipment, it can be pumped over long distances under a low pressure and with a consistent and stable density and quality. It can also be used to easily create a slope.

For the planet, as it is foamed on site, Airium® in lightweight applications makes a difference by drastically reducing the number of trucks on the road. It is also a great choice to diminish the overall weight put on the structure. And less weight means a lessened carbon dioxide profile for your project. Finally, Airium® is fully mineral, recyclable and does not emit any organic compounds.

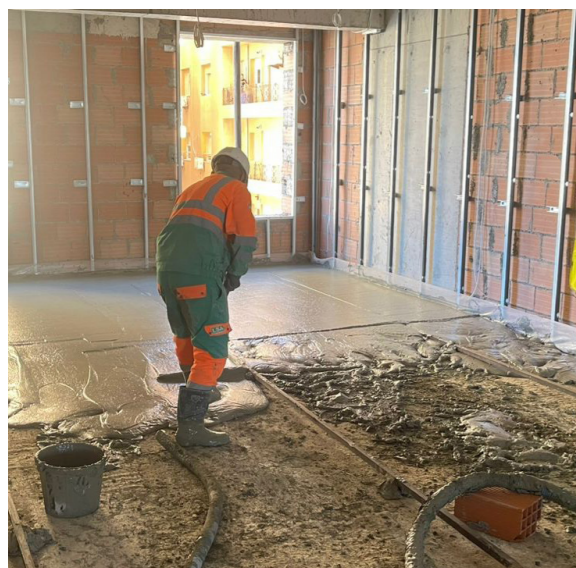


# TECHNICAL INFORMATION ON AIRIUM®



Airium® at different densities	Airium® 50	Airium® 70	Airium® 150
<b>Applications</b>			
<b>Floors</b>			Sub screed
<b>Roofing</b>	Non walkable attics		Walkable attics
<b>Blocks and precast</b>		Blocks	Sandwich walls
<b>Lightweight filling</b>			
<b>Density (dry)</b>	50 kg/m³	70 kg/m³	150 kg/m³
<b>Minimum thickness</b>	4 cm	4 cm	4 cm
<b>Thermal conductivity (dry)</b>	0,037 W/m.K	0,042 W/m.K	0,055 W/m.K
<b>Compressive strength</b>	10 kPa	20 kPa	150 kPa
<b>Fire Resistance</b>	A1	A1	A1
<b>Water vapour permeability (µ-value)</b>	3	3	5
<b>VOC Emission (Eurofins)</b>	A+	A+	A+

Airium® 250	Airium® 400	Airium® 600	Airium® 1000
Sub screed and sub slab		Screeds	
	Insulating slope		
Geotechnical and lightweight filling applications			
250 kg/m³	400 kg/m³	600 kg/m³	1000 kg/m³
4 cm	4 cm	4 cm	4 cm
0,070 W/m.K	0,10 W/m.K	0,14 W/m.K	0,35 W/m.K
500 kPa	1500 kPa	2500 kPa	> 5000 kPa
A1	A1	A1	A1
7	11	15	40
A+	A+	A+	A+



# AIRIUM

Airium® is a mineral insulation foam technology. It is fully fire-resistant, long-lasting and sustainable. It can fill any type of shape and cavity, either on site or in an industrial controlled environment. Airium® can be used in a variety of applications – from blocks to roofs to floors – as it offers a wide range of possible compromises between insulation and structural performances.

## Want to know more?

Get in touch with the Airium® team on [airium@holcim.com](mailto:airium@holcim.com)

Discover the epic quest for insulation on [airium.com](http://airium.com)

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