



Sustainable and yet affordable – how AAC manages the balancing act

Since its invention about 100 years ago, autoclaved aerated concrete (AAC) has established itself as a preferred building material in the construction industry in terms of ecological, economic and safety aspects. AAC offers a variety of benefits that make it the ideal choice for sustainable and affordable construction. It is also the easy and fast processing on the construction site that makes this building material a versatile all-rounder.

Sustainability and CO₂ reduction

One of the most outstanding properties of AAC is its potential to make a significant contribution to achieving climate goals. Studies show that this building material can not only become climate-neutral by 2050, but even have negative CO₂ emissions. This means that AAC is able to bind more CO₂ from the atmosphere than is released during its production. Through the process of (re-)carbonation, in which carbon dioxide from the ambient air is absorbed during the life of a building, AAC makes a significant contribution to CO₂-reduction in the construction industry. After 80 years, a re-carbonation level of 95% is expected, making it a carbon-negative material in the long term.

The production of AAC is very sustainable, as it follows a closed-loop process in which no waste is generated. Unhardened AAC residues are reused directly in the production process, which closes the material cycle and increases efficiency. Since AAC consists to up to 80% of air, only a few natural raw materials such as sand and lime are required for its production – keyword resource conservation.

Furthermore, there are efforts to include more recycled materials from demolition work in new production, which will further improve the environmental balance. This recyclability and the efficient use of raw materials make AAC a pioneer in the sustainable construction industry.

Excellent thermal properties

AAC offers exceptional thermal insulation properties that can significantly reduce energy consumption for heating and cooling. Thanks to the pores trapped in the matrix of the material, AAC provides excellent thermal insulation, resulting in lower energy costs and better living comfort. This makes it particularly attractive for the construction of low-energy houses or even plus-energy houses that generate more energy than they consume.

Fire resistance and safety

AAC offers the highest level of safety in the event of a fire, as it is classified as a non-combustible material and as it can withstand temperatures of up to 1200°C. In addition, no toxic gases are produced in the event of a fire, which increases the safety of residents and rescue workers. This property makes AAC particularly suitable for construction in densely populated areas, for renovation of existing buildings or generally in buildings with high fire protection requirements. There are also insurance companies that charge low premiums when using building materials with high fire resistance.

Easy processing and fast construction times

With a weight of approx. 20% of the weight of conventional concrete, AAC is easy to handle and thus enables faster construction. This not only reduces labour costs, but also the need for heavy construction equipment. Due to its ease of machinability, AAC is easy to cut and adapt to the conditions on the construction site, making the construction process more flexible and efficient.



Construction costs

AAC is a particularly efficient and inexpensive building material, especially when considering the total costs in terms of acquisition, construction time and building maintenance. Especially in projects where fast construction and good thermal insulation or maximum energy savings are required, AAC has clear cost advantages over other building materials.

The ease of processing of the material has a positive effect on the speed of construction and reduces labour costs. Due to the possibility of large product formats (blocks, wall- and floor panels) and its good machinability, the use of AAC can lead to faster completion of construction projects.

Due to its excellent insulation values and the associated energy savings, AAC can significantly reduce the operating costs of a building over its entire service life. This makes it particularly attractive to builders who consider not only the initial investment but also the long-term costs. The high resistance to weather influences and pests are also clear advantages. The resulting durability ends in lower maintenance and repair costs compared to traditional building materials such as bricks or timber.

The long-term carbon sequestration of AAC will result in lower costs in terms of carbon taxes or regulations in the future, making AAC a more cost-effective choice compared to conventional building materials.

Conclusion

AAC is not only a versatile, lightweight yet load-bearing building material, but also a decisive factor in the transition to sustainable and climate-friendly construction. With its ability to sequester CO₂, and the properties of high energy efficiency, fire resistance and economic benefits, AAC represents the future of construction, balancing sustainability and affordability at the same time. Builders and architects are well advised to concentrate on materials such as AAC in their planning in order not only to reduce life cycle costs to a minimum, but also to protect the environment in the long term.