METAL CEILINGS ARE SUSTAINABLE AND A RESOURCE FOR FUTURE GENERATIONS

The term sustainability is currently the big issue in the construction industry. Experts from the construction industry, trade and planning translate "sustainability" as a summary of the properties long-lasting, environmentally friendly and durable. For the implementation of sustainable, energy-efficient and resource-saving buildings, the choice of materials for the interior design is of the utmost importance.

The demand for the sustainability of a building material is a challenge for future generations. All systems involved in a sustainable economic cycle can withstand a certain level of resource use over the long term without being damaged. Building materials and reliable building systems are an important production factor in the building process. The construction industry needs longterm concepts for responsible use of our finite resources. Then there is the realization: Ecologically sound - and propagated by the experts - the evaluation of a building over its entire life cycle.

Conventional building is characterized by large flows of energy and materials. Half of the world's consumption of material resources is caused by our built up environment. In the future, we therefore need building and planning qualities that are practically applicable, measurable and transparent according to scientifically founded criteria in order to improve our environmental balance.

OUR BUILDING SYSTEMS ARE TOMORROW'S RAW MATERIAL

There is currently an acute shortage of materials in the German construction industry. Steel, aluminium and other building materials are unavailable for building. The shortage of building materials endangers both new construction projects and renovation work, so it is important to make provisions for the future. We must therefore understand our existing buildings as a source of raw materials for tomorrow. Steel or aluminium products used in buildings, for example, are not waste, because metals such as steel and aluminium used in construction are not "consumed", but are used again and again. Construction experts therefore certify that steel and aluminium are highly recyclable.

Photo 1 - Scrap metal is a raw material that is waiting to be used again.

One can venture the prognosis that demolition work in the future will not cause more costs, but rather, used for „mining raw materials", to generate profits. In so-called "urban mining", dismantled systems made of metal will be essential in the future for the supply of raw materials and in terms of resource conservation.

UPCYCLING STEEL IS A FUTURE TREND

Steel can be recycled without loss. If the building material is upgraded to a new product of the same or better building, so-called upcycling takes place.
A remarkable example of upcycling is the construction of the tallest building in the world: the upper floors of the Burj Khalifa high-rise in Dubai are predominantly made of steel, which originally came from the former "Palace of the Republic" in Berlin.

Steel is therefore a durable, timeless and one of the most recycled raw materials in the world. Around 570 million tons are recycled around the world every year. Because there is no loss of quality during the recycling process, steel is one of the most sustainable materials. The building material steel has not yet been exhausted; further potential of the building material lies, for example, in the engineering of material optimization for the respective application.

Photo 2 - The high-rise Burj Khalifa in Dubai was built with scrap steel that originally came from the former "Palace of the Republic" in Berlin.

ALUMINUM HAS A GOOD ENVIRONMENTAL BALANCE

Aluminium is a metal that is used around the world, far beyond the construction industry. Aluminium has the potential to be a raw material with a good ecological balance. In contrast to other materials, pure aluminium can be melted down again and again for high-quality products without any loss of quality. There is no qualitative difference to the primary metal that is extracted from the ore bauxite.

Aluminium recycling is particularly energy-efficient: remelted aluminium only requires 5% of the energy that would otherwise be needed for primary aluminium.

The construction industry also uses aluminium as metal ceilings. In this form, the building material can be easily dismantled and can be reintroduced into the raw material cycle without any loss of quality. In Germany, more recycled aluminium is produced than new aluminium is produced. The recycling rates for the metal material are very high in this country. Around 95 percent of aluminium is reused in the construction of buildings and transportation hubs.

3R- BUILDING MATERIALS STAND FOR THE FUTURE OF BUILDING

The term „3R "(Reduce, Reuse, Recycle) stands for the three areas of reducing, reusing and recycling. Thus, the basic requirements for a resource-saving, sustainable building recognized by experts are given.

Reducing:
Building materials are recyclable materials and therefore should be used as effectively as possible.

Reuse:
Our buildings are the raw material stores of the future. Modern building materials must be installed in a way that ensures that they can be easily detached and separated again.

Recycling:
Steel or aluminium that has already been used is not considered construction waste. Metal is a permanently valuable building material - now and in the future.

Even if we only mention the building materials steel and aluminium in relation to metal ceilings, the principles described above naturally also apply to other metals used in construction.

Photo 3 - Porsche exhibition Basel.

From the steel or aluminium façade to the metal ceiling to the steel beam or aluminium pipe, they can be recycled after a useful life of usually a few decades and are largely available again for the industrial cycle. For its part, this recycling process has been around for decades and has proven itself. Since the material is used as a raw material for recycling, there has always been a monetary remuneration when it is returned.

STEEL AND ALUMINIUM USED IN METAL CEILINGS

Metal ceiling systems have proven themselves for decades as a building material for high-quality interior design. The metal ceilings, which can be manufactured with high precision, can be prefabricated at the factory in all sizes and prepared for on-site assembly.

Photo 4 - A sporting goods manufacturer in Herzogenaurach decided on a very special ceiling construction with the metal baffles.

Photo 5 – A sporting goods manufacturer in Herzogenaurach decided on a very special ceiling construction with the metal baffles. © Rasmus Hjortshøj – COAST

Practically every creative idea that can be presented in planning can be realized with metal ceilings. In addition, technical installations, i.e. lights, fire alarms, loudspeakers, can already be easily integrated depending on the system. Acoustic or design requirements can be met safely and reliably with metal ceilings.

ADVANTAGES OF METAL CEILINGS

The useful life of components according to the sustainable building assessment system / BBSR table 2017 /, is over 50 years. After this period, a metal ceiling is not worthless, but can be returned into the metal production cycle as a high-quality raw material.

Within the expected service life of several decades, there will always be technical additions or repairs in private as well as in commercial buildings.

A great advantage of metal ceiling systems is that they can be removed and reused without damage. This is a great advantage, especially for renovation and maintenance work. In general, metal ceilings offer permanent and easy access to the ceiling void due to their robustness.

METAL CEILINGS AS HEATED AND CHILLED CEILINGS

Reliable heating and cooling are elementary comfort features for the users of a building. As heating and cooling ceilings, metal ceilings contribute to a pleasant room climate. The fact that a ceiling system can be used both for heating and for cooling a room is an invaluable advantage.

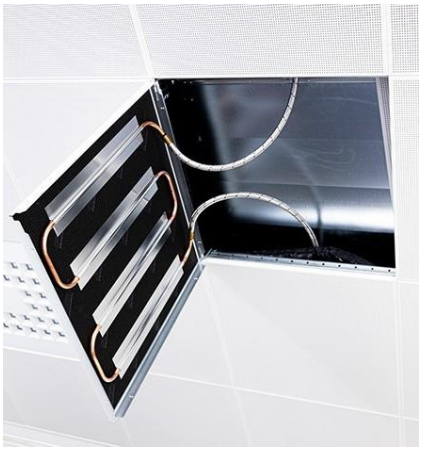

Photo 6 - The room temperature can be reliably controlled with heated and chilled ceilings.

Acoustic requirements for ceiling systems are met. For the feeling of a subjectively felt comfort, three factors are decisive. In addition to the air humidity, the air and surface temperatures also play a role. The indoor climate is of great importance in office buildings, cause it helps to create a quality of stay that is perceived as pleasant and thus increases the users' ability to concentrate and perform.

Heating and cooling ceilings - in general they are also referred to as surface tempera-ture control systems - have a positive cost balance.With just one hydraulic circuit, buildings can be kept at the desired temperature reliably and with low operating costs due to the flow temperatures that can be generated eco-nomically. The heating and cooling ceiling remains reliably and accessible in the event of maintenance.

CONCLUSION

Metal ceilings meet all requirements for modern, sustainable building materials. They are long-lasting and, even after more than fifty years of use, do not count as "scrap iron", instead they are raw material for crossgenerational reuse.

Photo 7 -Metal ceilings in the Herti shopping center, Switzerland ©Plafondnova

WHICH BUILDING PRODUCT CAN OFFER COMPARABLE ADVANTAGES?

Published by TAIM e.V.
www.taim.info

in November 2021