

Recycling of glass wool and investigation of impact sound behavior in lightweight floor constructions

The Swedish building industry stands for over 7 million tons of the country's yearly waste production today. The world's waste mountain is rapidly growing, and as the building industry stands for a large part of it, they bear a huge responsibility to do better when it comes to recycling waste materials. In the master thesis that this article is based on, it was investigated if a gravel-like material made from glass wool waste could be used to improve the sound insulation in floors of high-rise timber framed buildings.

The interest of building high rise timber framed buildings are increasing. It can be argued that building with timber is better for the environment in comparison with using concrete. This is because of the large amount of gravel, water, cement and energy that is needed to make concrete. Wood on the other hand, is a renewable source and stores carbon dioxide during its growth.

As of today, there are no good way of recycling glass wool waste but a new method has been tried out. This new method is both cheap and energy effective. With the new method, glass wool waste becomes a gravel-like material. It has been investigated if the new material could be used as ballast in wooden floors of high rise buildings to improve sound insulation between floors. Today, there is a problem with insulating wooden floors from impact sound, meaning the type of sound that comes from walking on the floor. These types of sounds were further investigated with help from a calculation program called Abaqus.

From a market survey of intermediate floors, it was found that gravel, sand, concrete or glass wool can be materials used as addition to insulate or prevent vibrations in the floors of a high rise building. All these materials are unfortunately made from so called virgin materials which basically means they belong to an ending supply here on earth. If these materials could be replaced by a recycled material, the wooden house could be made even more eco-friendly and much waste material could be useful again.



From calculations it was found that there was no significant improvement for impact sound when using a ballast material as filling in an intermediate wooden floor. This probably has its explanation in the material's structure, meaning it being a "gravel-like" material and not a "concrete-like" material. It is however of greatest interest to either continue developing the material to give it the right properties to function as an insulation material, or find another application for it. This is partly because of the great environmental advantage the recycling of glass wool could give to the building industry but also because of the cheap, and energy effective recycling process that it actually is.

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