

ECO-FRIENDLY AND SELF-SENSING MORTAR



A self-sensing concrete/mortar cement-based material is obtained by processing industrial by-products/wastes, such as gasification chars and recycled carbon fibers. This self-sensing material has the advantages to be more eco-friendly, much cheaper, easily dispersible, not toxic and with properties comparable to currently available commercial products. The simultaneous addition of recycled carbon fibers and fillers (such as char) in the mortars allows to obtain a complete conductive network and low resistivity values even with a low dosage of carbon fibers that do not cause binding problems during mixing.



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KEYWORDS:

char, Concrete, Eco-friendly, Mortar, Recycled carbon fibers.



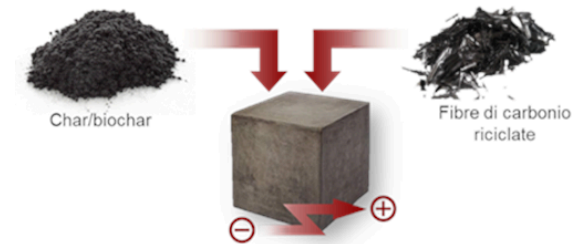
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DESCRIPTION

The conductive fillers are interposed between one conductive fiber and the other, closing the conductive path with a reduced electrical resistivity and at the same time improving its resistance and robustness. Consequently, the mortar / concrete has self-sensing properties, greater resistance to deformation under stress, water penetration and cracking. The gasification char ranges from 0.5% to 1% by volume of the mixture. The recycled carbon fibers are present in a percentage ranging from 0.05% to 0.2% by volume of the mixture, have a diameter of 7 μm and a length of 6 mm. The mortar / concrete, is prepared through a normal agitation and maintenance process, and can be used to create concrete structures with self-diagnostic capabilities, greater safety, greater durability, cathodic protection, shielding and electromagnetic absorption. All at a reduced cost.



APPLICATIONS

- Buildings, bridges, tunnels and other similar.

ADVANTAGES

- Low costs conductive fillers/additions;
- Eco-friendly (recycled carbon fibers and fillers) and low toxicity;
- Higher conductivity with lower dosage of conductive fibers;
- Easier uniform dispersion;
- Comparable/Enhanced durability and mechanical properties thanks to the filler effect;
- Wide application use;
- Reduction of the production costs of high-performance multifunctional concrete materials;
- Electromagnetic shielding/absorption;
- No weight increase.

