ECOTECH - Eco-innovative composite materials using recycled raw materials for electrical engineering applications

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The subject of the inventions is a method of obtaining a composite material and an electromagnetic field shielding composite material, which have applications in the electrical, electronic, electrical and construction industries, in companies engaged in the production of packaging, wall cladding, as well as the disposal and recycling of waste materials from the energy and metal industries.

Patent P.439466: Method of obtaining composite material and composite material

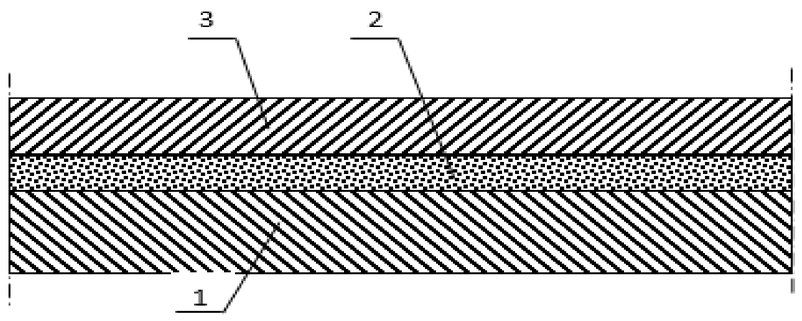

Fig. 1. Cross-section of the composite. 1 - layer containing ceramic powder 2 - layer containing nanocrystalline flakes3 - layer containing zendra flakes

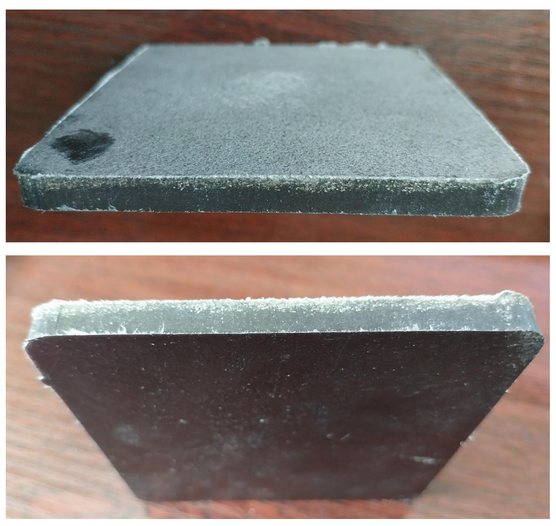

Fig. 2. Example of making a three-layer composite. 1 - view from the side with the ceramic layer, 2 - view from the side with zendra layer

Fig. 3. Test chamber made of developed composites

he method for obtaining the composite material is characterized by the fact that, in sequence, the scale mixture in an amount of 50-60% by weight, the nanocrystalline mixture in an amount of 20-25% by weight and the ceramic mixture in an amount of 20-25% by weight, are poured into a pressing mold, after each pour, equilibrated and subjected to pressing in a mold-stamp system advantageously at a pressure of 30-35 MPa advantageously at a temperature of 110-115°C advantageously with a pressure change up to 5-6 MPa in time until plasticization, advantageously at a time up to 350s, whereby the mixtures are obtained in such a way that the polymer advantageously in the form of a powder in the amount of 98-99% by weight is mixed with a pro-adhesive agent in the amount of 1 to 2% by weight and homogenized, and the polymer mixture so prepared is divided into three parts in the proportion of 50-60% first part, 20-25% second part, 20-25% third part, where:

- To part one of the polymer mixture, flakes of mill scale with a fraction of less than 3mm are added in an amount accounting for 70-80 % by weight of the total mixture formed, and the scaling mixture thus formed is poured into the press mold,
- To part two of the polymer mixture, nanocrystalline flakes from the grinding of nanocrystalline tape are added in an amount constituting 70-80 % by weight of the total mixture formed, and the nanocrystalline mixture so formed is backfilled into the pressing mold,- to the third part of the polymer mixture, ceramic powder is added in an amount constituting 70-80 % by weight of the entire mixture formed, and the ceramic mixture so formed is backfilled into the pressing mold. The object of the invention is also a composite material.

Patent: :P.439467: Method of obtaining a shielding composite material and shielding composite material

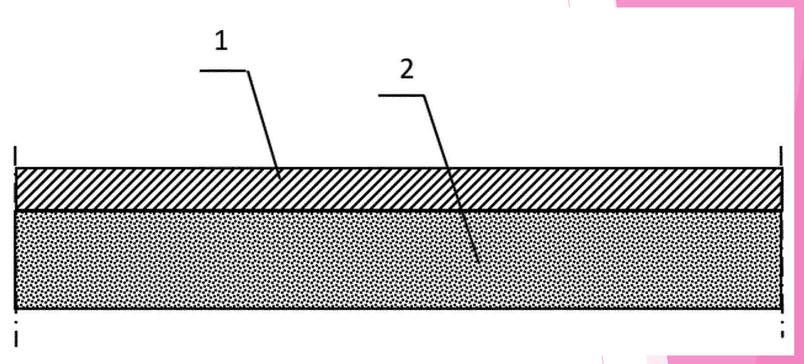

Fig. 4. Cross-section of the composite. 1 - layer containing ceramic powder 2 - polymer-zinc-nanocrystalline layer

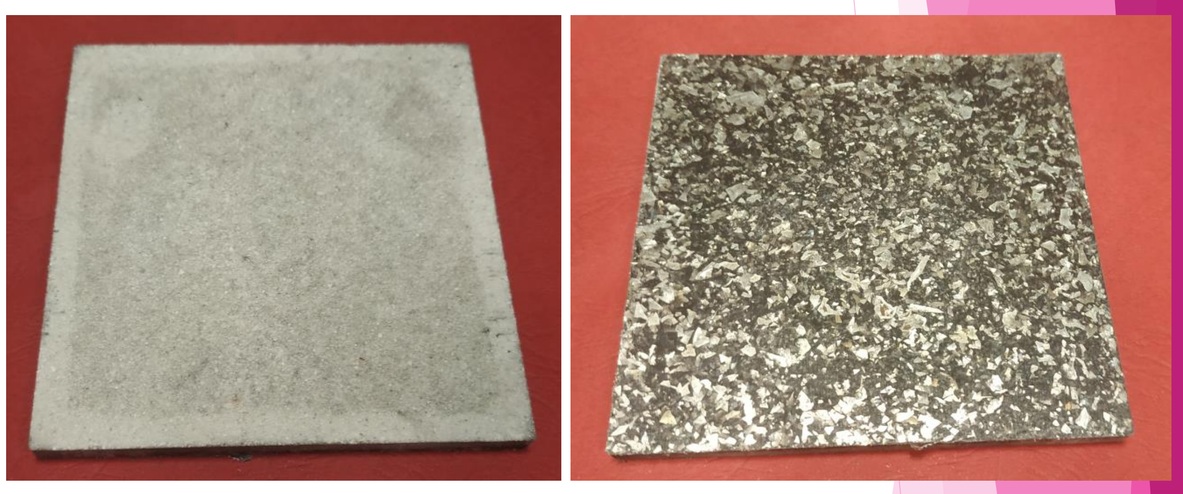

Fig. 5. Przykład wykonania kompozytu. 1 – strona z warstwą ceramiczną, 2 – strona z warstwą z zendry

The method of obtaining the composite material is characterized by the fact that, in sequence, the scale-nanocrystalline mixture in the amount of 70 - 80% by weight and the ceramic mixture in the amount of 20 - 30% by weight, is poured into the pressing mold, after each charge is leveled and subjected to pre-pressing advantageously at a pressure of 5 - 6 MPa, then the entire charge is pressed in a mold-stamp system preferably at a pressure of 30 - 35 MPa preferably at a temperature of 110 - 115°C, preferably with a pressure change to 5 - 6 MPa for a time until plasticization, preferably up to 350 s, and the mixtures are obtained in such a way that the polymer preferably in powder form in an amount of 98 - 99% by weight is mixed with a proadhesive agent in an amount of 1 - 2% by weight and homogenized, and the polymer mixture prepared in this way is divided into two parts in the proportion of 70 - 80% first part, 20 - 30% second part, where to the first part of the polymer mixture is added flakes of mill scale with a fraction of less than 3 mm in an amount representing 50 - 65% by weight of the total mixture formed, and nanocrystalline flakes from the grinding of nanocrystalline tape are added in an amount representing 15 - 20% by weight of the total mixture formed, and the nanocrystalline mixture formed in this way is poured into the pressing mold, and ceramic powder is added to part two of the polymer mixture in an amount representing 70 - 80% by weight of the entire mixture formed, and the ceramic mixture formed in this way is poured into the pressing mold. The subject of the application is also a composite material.