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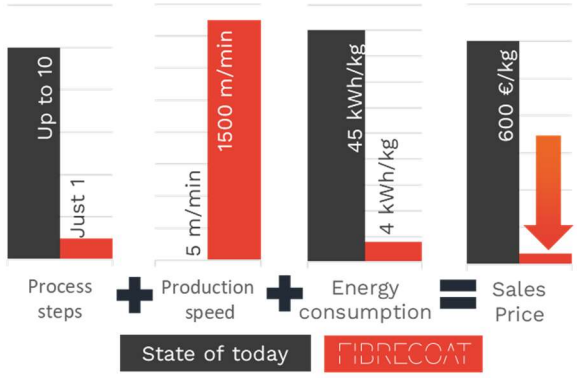
AluCoat product briefing for chaff countermeasures

Introduction:

AluCoat is a multi-filament yarn consisting of individual basalt filaments with an aluminum coating. It is produced on standard glass and basalt fiber spinning lines. In these lines a coating module is added right below the fiber formation area enabling the coating of each individual filament with liquid aluminum.



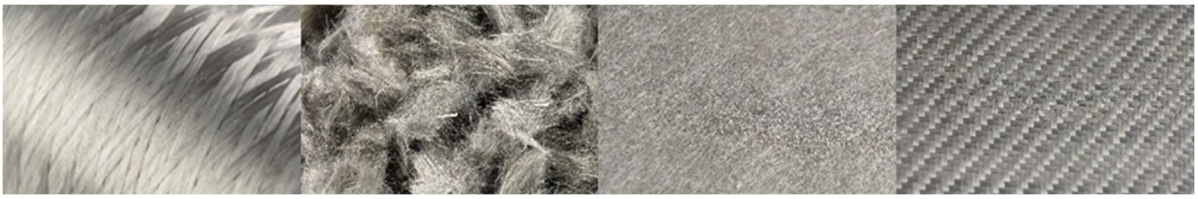
Because of the high speed of the process and low diameter, the fibers cool quickly, and a sizing can be applied in the process. The sizing can be adapted to meet different industry requirements, i.e., processability, adhesion, separation and many more. Subsequently, the fibers are wound on to a bobbin for further processing. Both the spinning lines and the sizing formulations are handled by established industrial partners of FibreCoat. Using existing fiber spinning equipment and the high process speed, AluCoat reduces the price of conductive fiber solutions by at least 10 times.

Properties:

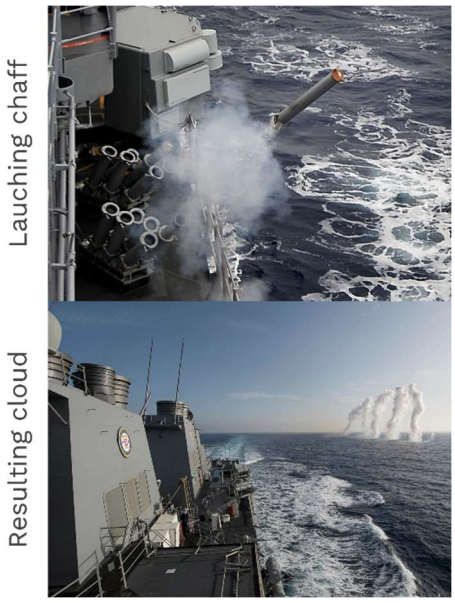
The filaments spun with the FibreCoat process have a diameter of 23 µm and can be supplied in different yarn counts ranging from 30 to 600 tex. Higher yarn counts are possible as special order. The resulting yarns have high mechanical properties because of the basalt core as well as a high thermal and electrical conductivity due to the aluminum coating (see product data sheet). As all materials used in the production are non-flammable the material itself is fire resistant and heat resistant to 500 °C. Although AluCoat is a composite fiber, recycling is not a problem. The composition of the fibers is comparable to that of aluminum deposits found in nature. This means that the material can be fully recycled in standard industrial aluminum processing. Along with these advantageous properties, the material has typical yarn properties and is versatile in processing.

Forms:

The AluCoat yarn can be used as a yarn for energy/data/signal transmission in similar fashion as cables. Furthermore, it can be stitched or placed on substrates to create conductive paths. The yarn can be chopped into different fiber lengths for the use as short (i.e., injection molding) or long (i.e., LFT) fiber reinforcement, adding conductive and EMI shielding properties to the resulting parts. Due to its high flexibility, AluCaot can also be processed into various textiles. FibreCoat already developed different non-woven and woven fabrics. Soon these will be complemented by braided and knitted textiles. While every textile form comes with different properties, they can all cover a spectrum of properties on porosity, EMI shielding, heat conduction, anti-microbial and strength. In addition, these fabrics can be used in composites where the aforementioned properties are retained and applied. The aluminum surface of the fibers dyeable through anodization, making the fabrics and composites a viable material for design applications with a need for metal shine.

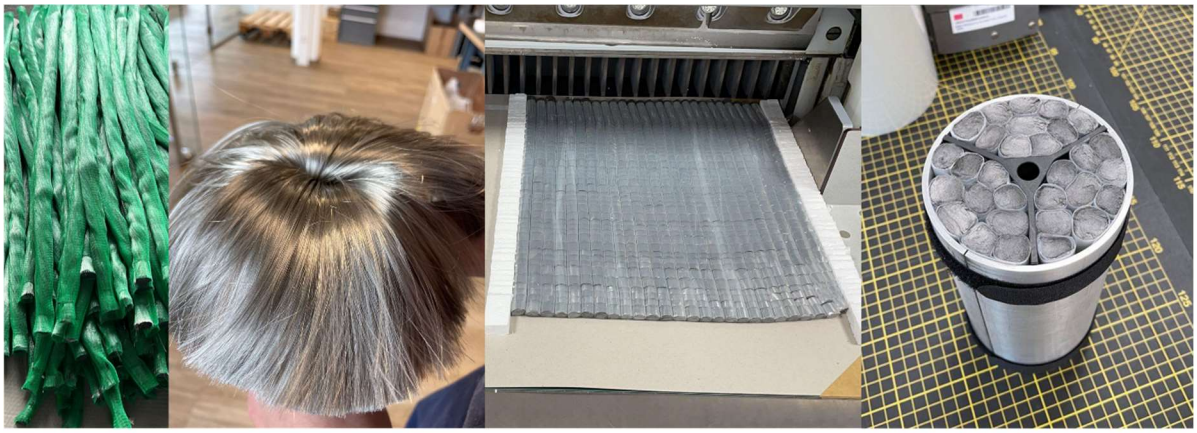


AluCoat as chaff:



Chaff is a radar countermeasure in which crafts disperse a cloud of material which either appears as a cluster of primary targets on radar screens or swamps the screen with multiple returns, in order to confuse and distract attackers. It is used by modern navies and air-forces to distract radar-guided missiles from their targets with most military aircraft and warships having chaff dispensing systems for self-defense.

In order to make AluCoat fibers ready for chaff material usage, FibreCoat adapted the underlying production technology by developing a sizing that leads to the complete separation of the individual filaments, controlling the diameter as well as the total number of the filaments in a tight range. With this technology hanks are produced which are subsequently cut to specific lengths that correspond to the radar frequencies that should be reflected in the application. These cut fiber bundles are then packed into a payload with or without a dispersion charge in its center. These payloads are then mounted onto carriers which are specific to the countermeasure systems used by ships or aircraft.



FibreCoat is ready to provide hanks that are produced and designed for your specific chaff material needs. Together with our partners in Germany we can offer subsequent products up to the finished payloads as well as testing of the finished products with state of the art radar equipment.

Reach out to learn more!