NONWOVENS WITH COMPOSITE ELECTRICALLY CONDUCTIVE FILLERS

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Nonwovens are textile planar fiber materials formed by randomly distributing fibers. Nonwovens are traditional and historical materials and have a wide range of practical applications. Traditional methods of producing nonwovens are mechanical combing from finished fibers, while modern methods are spraying from a melt or solution onto a substrate, with fibers formed during the spraying process.

The fibers can be formed by pressing through the forming holes of a die or by elongating the melt or solution jet. The driving force in this process is the hydrodynamic gas flow or electrostatic forces. The main technologies for the production of synthetic nonwovens are the technologies of aerodynamic melt spraying (melt blow) and the combined process of molding through a die and aerodynamic orientation and spraying (span bond) [1].

Nonwovens are widely used in many areas of modern production. Compared to fabrics, nonwovens are manufactured using a simpler technological process and at a lower cost, which is a favorable factor for their market distribution. Due to the structure of nonwovens, they have low mechanical properties, which necessitates their post-processing, such as heat bonding, needle punching, gluing, lamination, and pneumatic interlacing. The main end-use of nonwovens is realized for their post-processed form [2].

The fields of application of nonwovens are constantly expanding, which requires the search for new functional properties [3]. A modern way to modify the properties of nonwoven materials is to use composite polymeric materials to create them.

There are industrial applications of passive fillers based on natural calcium carbonate, which are introduced into the polymer melt before its molding. Nonwovens derived from composite materials have a number of features, including increased density, branched fiber surface, and reduced cost.

Of considerable interest is the use of functional materials with conductive properties as a filler. The creation of nonwoven materials based on polypropylene containing a dispersed electrically conductive filler - carbon black and carbon nanotubes - has been investigated. The use of the created nonwoven composite materials to reduce the intensity of electromagnetic radiation in the development of camouflage screens was investigated.

References

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