Spunlaced Flax/Polypropylene Nonwoven Composite for Auto Interior Application

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ABSTRACT

The spunlacing technique for producing auto interior nonwovens was examined. Flax/Polypropylene nonwovens were carded, crosslapped, and needle-punched with a 50/50 blend ratio by weight. The spunlacing process was carried out using an AquaJet spunlace machine with two different settings of water pressure. The spunlaced nonwovens were thermally bonded into 2D and 3D interior parts by a panel press and a stamp-forming press. According to the ASTM, DIN, and other relevant industrial standards, the experimental spunlaced nonwovens were instrumentally evaluated in terms of nonwoven physical properties, mechanical properties, acoustical properties, fogging property, and moldability. The statistical method of variance analysis and method of image analysis were used for data process. The research found that the spunlacing technique helped the flax/Polypropylene nonwoven expand the end use for auto interiors with particular technical merits of enhancing tensile and flexural strengths; reducing thickness with controlled ultimate weight; increasing noise absorption coefficient and transmission loss; and improving nonwoven moldability and fogging performance. The study also revealed that using a setting of lower water-jet pressure for spunlacing process was more suitable for entangling flax/polypropylene nonwovens to produce high performance auto interior composites.