On the Glow: Assessing the Luminosity, Durability, and Reflectivity of Strontium Aluminate Applied to Road Striping

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With thousands of people dying daily in car accidents, and almost half occurring at night, the lack of roadway visibility needs to be addressed. Strontium aluminate is a nontoxic compound that absorbs light energy and slowly emits it in the form of a glow. The purpose of this experiment was to determine if different particle sizes of strontium aluminate applied to thermoplastic road striping would benefit drivers at night due to the glow emitted. The researchers hypothesized that out of six samples, the strontium aluminate of Grade 8, Grade 18, and Grade minus 200 would perform best on luminosity, reflectivity, and abrasion tests, respectively. The researchers applied a 3:1 ratio of strontium aluminate to glass beads to hot thermoplastic using a spray gun for each sample. Then, the researchers photographed the luminosity and reflectivity for three trials of each sample and analyzed them using an image color summarizer. Next, the researchers ran three abrasion trials per sample using a drill press and abrasion disk to measure mass lost. Finally, the researchers repeated the image color summarizer analysis to determine glow and reflectivity loss after abrasion. Sample 1, Grade 8 had the greatest luminosity. Sample 5, Grade minus 200 had the least mass loss due to abrasion. All results were analyzed using ANOVA tests and t-tests. Based on the analyzed results, the concept of glow in the dark road striping could be a viable solution to nighttime accidents.

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