The Environmental Enhancements Reclaimed Rubber Has on Roads

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The constant use of roads causes serious wear on asphalt. As a solution to this problem, the application of rubberized asphalt is used in Arizona, Southern California, and Washington. The ground tires used in roads from these areas are vulcanized and have been demonstrated to improve road life and sound pollution. The effect of non-vulcanized rubber in road asphalt may have additional benefits due to its unique properties. The tires used in this experiment were non-vulcanized rubber from bicycle inner tubes that were cryogenically pulverized. To determine the effects of this rubber on asphalt, several samples with varying amounts of rubber were made. The addition of a supernumerary amount of rubber resulted in catastrophic failure. The rubber absorbs the binder used to hold the asphalt mixture together, causing it to crumble and fall apart. This was the case in samples with 10% or more rubber added. Asphalt samples with 3% rubber or less stayed intact; although, it was on the brink of deterioration until it cooled to room temperature. Samples with 0%, 1%, 2%, and 3% rubber underwent tests in tensile strength, compressibility, noise absorption, energy absorption, and surface hardness. The 3% sample absorbed more noise and energy, as well as showing increased tensile stress strength. This sample also demonstrated the most compressibility based on the results of these tests. The addition of minimal amounts of non-vulcanized rubber to asphalt may make asphalt more pliable and sound absorbent creating a more adaptive and quieter road.

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