Increase of Tangential Force by Ceramic Particles on the Low Adhesion Condition

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Vehicle slipping and sliding caused by fallen leaves especially in autumn is an important issue that needs to be resolved in terms of safety and on-time operation. Though the equipment which apply ceramic particles between rail and wheel of vehicle to increase the adhesion has been developed, a complete solution has not yet reached at the peak of fallen leaves season. Therefore, the authors conducted a brake test to investigate the influence of particle amount and particle size on the tangential force. The test was conducted with paper tape attached to the rail for simulating leaves on the rail. The test results showed that the tangential force increased with the amount of particle apply. A correlation was also observed between the number of holes penetrated by particles remaining on the paper tape and the tangential force. In particular, a relatively good correlation was found between the estimated area of the holes and the tangential force. These results will contribute to design and performance evaluation of particle for improving adhesion between wheel and rail.