

Aggregate particle wear and the tyre / surface interface

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This paper considers the relationship between aggregate particle wear and stress at the tyre / surface interface. Changes at this interface during its life influence surfacing properties including skid resistance, noise generation and rolling resistance. This paper combines two areas of study to consider such change. It looks at the wear of aggregate particles due to simulated trafficking and changes in contact stress that result as a consequence. A modified wet micro-deval test was used to investigate aggregate particle wear. The modification involved carrying out a post-test grading analysis of the single-sized test sample. This offers simple insight into how original single sized particles change as a result of a standard amount of wear. It suggests how a given aggregate may perform in different types of use e.g. positive textured chip seal or relatively smooth SMA type surface. Interfacial stress was measured by placing a flexible pressure pad between a friction measuring tyre and idealised road surface textures representing increasing amounts of particle wear. These idealised textures had been drawn in CAD and then printed using a 3D printer. This allowed a range of interfacial stress conditions to be investigated under ideal laboratory conditions. Nominal size was found to effect contact stress. For a given nominal size contact stress increase as the particles become more rounded. This paper then considers how both studies can be combined to better understand the tyre / road surface interface with particular emphasis on friction measurement.