The friction measuring tire / road surface space interface

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Enveloping - Hamet and Klein (2000)





Enveloping - ROSANNE project (2016)



Enveloping of the tire / asphalt interface shown by paint removal



Paint removal during Friction after Polishing (Dunford, 2013)







Paint removal during PSV (Woodward et al, 2016)









Pendulum value v. % contact area



3d modelling of paint loss





Selected aggregates – paint loss occurs to a depth of about 0.3 to 0.4 mm



Important tires





Time for a rolling tire to move 10 mm



TEA MK1 and MK2





Measuring the contact patch using pressure mapping





Z-axis pressure distribution within contact patches







Tire deforming into the space







Gap width – HRA and 10mm SMA





TEA MK1 - nearly new tire, 20 psi, 233.4 N load, measured in central position, straight edge profile



TEA MK2 - comparison of tires for gap spacings up to 60 mm at similar vertical loads



Conclusions

- The TEA MK1 and MK2 test apparatus offer a simple means of investigating the principle of enveloping.
- The laboratory investigations considered factors that can be controlled and thought to influence the envelope space.
- Under static conditions and for all of the test conditions investigated, the main factor relating to tire embedment is gap width.
- Amount of tire embedment decreases until a critical gap space is reached and then remains fairly constant as gap space is further decreased.
- Data can be used to supplement other studies into the tire / surface interface relating to skid resistance, noise and rolling resistance.