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CORRELATION BETWEEN THE FRICTION COEFFICIENT AND THE IMPACT ABSORPTION RATE IN FOOTWEAR WITH DIFFERENT HARDNESSES

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Footwear was created from the constant pursuit of human beings to meet their basic needs for survival, as a means to protect the feet from humidity, cold, heat and uncomfortable surfaces. In human activities, the foot interacts directly with several surfaces, transmitting to the body the forces generated by them. Thus, it can be pointed out the footwear-ground interaction to determine its friction coefficient. The development of new material, mainly polymeric, in footwear outsoles, has suffered a major breakthrough. The polymer is an essential material today and is likely to become more and more used due to its properties, versatility and price. This study aims to correlate the different densities of the outsoles to absorb impact energy and the coefficient of static and dynamic friction. We used three different densities in the outsoles. The impact test was determined by the derivative of the first 50 milliseconds of foot contact with the ground, where two subjects gaited on a catwalk (in a speed of 5 km/h) which had a pair of force platforms, 20 trials were considered as valid, i.e. where the subject applies the weight within the force platforms and with the determined speed. The friction coefficient was established by the ratio between the normal force and the drag force determined by the SATRA machine. Preliminary results showed a correlation between the density and the impact energy absorption. Furthermore, it can be conclude that footwear with different densities has different impact absorption energies and friction coefficients, as well density is essential in the outsoles manufacturing, providing consumer comfort and safety.