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Experimental Characterization and Modelling of Asphalt Materials at Low Temperature

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Deadline for manuscript submissions:
closed (31 May 2020)

Message from the Guest Editors

Road infrastructures represent a fundamental asset for the economy of both developed and developing countries. Most paved roads consist of flexible pavements, and these are commonly designed with asphalt mixtures, which are a composite of asphalt binder, aggregate, and air voids. Such a composite material is required to fulfill different functionalities, such as providing a smooth and safe pavement surface while being capable of withstanding different load-induced phenomena due to traffic and climate actions. At low temperature, asphalt mixtures may experience significant distresses associated with the increase in thermal stress by itself, with the combination of thermal stress and traffic-induced stresses, with the fact that asphalt may become brittle at low temperature, or because of the thermal cycles linked with daily change in temperature. All this can eventually lead to cracking and failure. At the material level, this implies that not only the mixture itself, but also its constituents and its sub-phases (e.g.,mastic, mortar, and fine aggregate matrix) must provide adequate performance.

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