World Academy of Science, Engineering and Technology
International Journal of Mathematical and Computational Sciences
Vol:14, No:12, 2020

Experimental Investigation to Find Transition Temperature of VG 30 Binder

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Abstract : In India, most of the pavement is laid by bituminous road and the consumption of binder is high for pavement construction and also modified binders are used to satisfy any specific pavement requirement. Since the binders are visco-elastic material which is having the mechanical properties of binder transition from visco-elastic solid to visco-elastic fluid. In this paper, two different protocols were used to measure the viscosity property of binder using a Brookfield Viscometer and there is a need to find the appropriate mixing and compaction temperatures of various types of binders which can result in complete aggregate coating and adequate field density of HMA mixtures. The aim of this work is to find the transition temperature from Non-Newtonian behavior to Newtonian behavior of the binder by adopting a steady shear protocol and the shear rate ramp protocol. The transition from non-Newtonian to Newtonian can occur through an increase of temperature and shear of the material. The test has been conducted for unmodified binder VG 30. The transition temperature was found in the unmodified binder VG is 120oC. So the application of both modified binder and unmodified binder in the pavement construction needs to be studied properly by considering temperature and traffic loading factors of the respective project site.

Keywords : unmodified and modified binders, Brookfield viscometer, transition temperature, steady shear and shear rate protocol
Conference Title : ICSRD 2020 : International Conference on Scientific Research and Development
Conference Location : Chicago, United States
Conference Dates : December 12-13, 2020

Open Science Index, Mathematical and Computational Sciences Vol:14, No:12, 2020 publications.waset.org/abstracts/40594.pdf