

## Abstract Details

**Title:** Effect of Liquid Polymer on Performance of polymer modified bitumen and its Mixes

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**Abstract:** An efficient road transport system provides a good level of service for its users. Roadways are considered to be the most common and important way for inland transport. Asphalt road infrastructure development is one of the major sectors contributing to the National economy. Modification of asphalt generally involves use of modifiers those appears in solid forms. The limitation of using such materials lies in the high softening and melting temperatures, blending of polymers/rubbers/latex with asphalt at high temperature for long duration, phase separation of polymer from Asphalt apart from availability of materials indigenously. This result in high cost of PMBs. Liquid polymers are easy to blend with asphalt at relatively low temperature and for a short blending time. The road development programmes envisaged for the country involving large amount of money, manpower, and materials will concern not only in the construction of new roads, but also the improvements of existing roads and their durability for design life. Liquid polymers have also been used for soil stabilization. This paper depicts the use of a new modifier-Vinyl Acrylic Copolymer (liquid form) for development of cost effective and high performance modified binder and its mixes applicable for construction and maintenance of asphalt roads. The goal of improving bitumen properties is achieved using 0.5 percent of a co-polymer of Vinyl and Acrylic Acetate functional groups in liquid polymer-1(LP1). Advantages of liquid polymer with bitumen binder are ease of mixing with bitumen at relatively low temperature. Improved compatibility of polymer with bitumen was obtained as there is no phase separation. Polymer modified asphalt composition was characterized as per IRC: SP: 53-2010 to assess the effect of modification on the properties of VG-30. LP-1 modified binder is used for preparation of asphalt mixes for B C grade-1 as per MoRTH 5th revision 2013. Job mix was prepared using VG-30 as per Marshall method and optimum binder content was obtained as 5.3(w/w mix). For comparative study Marshall Samples were also prepared with modified binder at the same optimum binder content (i.e. 5.3%). To study the behavior of conventional and modified bituminous mixes various engineering and volumetric properties e.g Retained Stability, Tensile Strength, Tensile Strength Ratio (TSR), Marshall Stability, flow value, unit weight, air voids are determined. The study indicated that the binder properties were improved marginally & accordingly the mechanical properties bituminous mixes were also found improved w.r.t Retained Stability and Indirect Tensile Strength and TSR. Bituminous concrete (BC) mixes developed with liquid polymer modified binders satisfied the requirement of IRC SP-53, 2010. The performance of modified mixes improved further with admixture of liquid polymer and fly ash to satisfy the requirements of high performance parameters such as rutting, thermal cracking and fatigue.

**Keywords:** Asphalt Road, Liquid Polymer, Blending, PMBs.