IS 3117:2004 Bitumen emulsion for roads and allied applications (Anionic Type) - Specification

This Indian Standard (IS) 3117:2004 specifies the requirements of bitumen emulsion (anionic type) for roads and allied applications. The standard covers the physical and chemical requirements of the bitumen emulsion, its homogeneity, and its performance over time.

Bitumen emulsion is a dispersion of very fine bitumen particles in an aqueous medium. It is easy to handle and has wide applications in road construction and maintenance, soil stabilization, grouting, tack coating, re-treading, seal coating, premixing, dust-spraying, mulch treatment, and other special circumstances where cold application of bitumen is desirable.

Firstly, the standard defines different types of bitumen based upon application - Rapid Setting (Type RS), Medium setting (Type MS), and Slow setting (Type SS). The bitumen emulsion specified in the standard should be homogeneous and show no undispersed bitumen after thorough mixing. The requirements for the bitumen emulsion are detailed in Table 1, which lists the characteristics of the emulsion and the test method used to evaluate them.

The tests described in the standard are:

- **Viscosity** (Annex A): The viscosity is measured using a Saybolt Furol viscometer at 25°C.
- **Bitumen Content** (Annex B): The bitumen content is determined by a standard method of evaporation.
- **Settlement** (Annex C): The settlement is measured by a standard method of separating the emulsion into top and bottom samples after a 5-day period of undisturbed settling.
- **Demulsibility** (Annex D): The demulsibility is measured by a standard method of adding a calcium chloride solution to the emulsion and then determining the percentage of bitumen that remains after a specified time.
- **Miscibility in Water** (Annex E): This test is conducted by adding water to the emulsion and observing the extent of coagulation.
- **Modified Miscibility in Water** (Annex F): The modified miscibility test is similar to the miscibility in water test but with a different concentration of calcium chloride.
- **Cement Mixing Test** (Annex G): The cement mixing test is conducted by mixing the emulsion with cement and water and then determining the percentage of emulsion broken.
- **Coating Ability and Water Resistance** (Annex H): This test is conducted by coating stone aggregate with the emulsion and then observing its ability to resist water.
- **Sieve Test** (Annex J): This test is conducted by sieving the emulsion through a standard sieve and determining the percentage of residue that is retained on the sieve.
- **Particle Charge** (Annex K): This test is conducted by immersing two copper plates into the emulsion and then measuring the particle charge on the plates.