Experiment No: 7 DUCTILITY TEST

Aim: To determine the ductility value of the given bitumen (IS 1203 – 1978)

Theory and Scope:

A certain minimum ductility is necessary for a bitumen binder. This is because of the temperature changes in bituminous mixes and the repeated deformations that occur in flexible pavements due to the traffic loads. It is of significant importance that the binders form ductile thin films around the aggregates. The binder material which does not possess sufficient ductility would crack and thus provide previous pavement surface. This is in turn results in damaging effect to the pavement structure. The ductility is expressed as the distance in centimetres to which a standard briquette of bitumen can be stretched before the thread breaks. The test is standardized by the IS: 1208. The test is conducted at 27°±0.5°C and a rate of pull of 50±2.5 mm per minute.

Apparatus:

- Briquette mould
- Ductility machine
- Knife

Sample Preparation:

1. Apply grease on the glass plate.
2. Arrange the end pieces and side pieces of the briquette mould on a glass plate. Apply grease on the insides of the side pieces of the mould.
3. Heat the bitumen sample to a pouring consistency and carefully pour into the mould

Procedure:

1. Allow the sample to cool in air for about 30 to 40 minutes.
2. Immerse the mould with the plate in a water bath maintained at 27º C for 30 minutes
3. Take out the mould and cut off excess bitumen, if any, with a sharp hot knife.
4. Replace the mould back in water for 85 to 90 minutes, at 27º C
5. With the help of hot knife, remove the side pieces of the mould and separate the sample from the plate
6. Carefully place the sample in the ductility machine on the plate provided. Fix the ends of the mould to the plate. Note the initial reading on the scale provided on the machine. It should be 0 (zero)
7. Start the ductility machine. The sample stretches and a thread is formed in the middle. The sample stretches at a uniform rate of 50 2.5mm per minute.
8. The thread formed at the middle breaks after some distance. The distance up to which the sample stretches before the thread breaks is recorded as the ductility value.

Calculation:

Test Parameter	Sample Number			Average (cm)
	1	2	3	
Ductility (cm)				

Result: The average ductility value of the given sample of bitumen = cm.