

BACKGROUND

In the flexible pavement construction where bitumen binders are used, it is of significant importance that the binders form ductile thin films around the aggregates. This serves as a satisfactory binder in improving the physical interlocking of the aggregates. The binder material which does not possess sufficient ductility would crack and thus provide pervious pavement surface. This in turn results in damaging effect to the pavement structure. It has been stated by some agencies that the penetration and the type of bitumen depends on crude source of the bitumen, sometimes it has been observed that the above statement is incorrect. It may hence be mentioned that the bitumen may satisfy the penetration value, but may fail to satisfy the ductility requirements. Bitumen paving engineer would however want that both test requirements are satisfied in the field jobs. Penetration and ductility cannot in any case replace each other.

OBJECTIVE

To determine the ductility of distillation residue of cutback bitumen, blown type bitumen and other bituminous products as per IS: 1208 - 1978.

REFERENCE

Ductility of bitumen as per IS: 1208 - 1978.

THEORY

The ductility of a bituminous material is measured by the distance in cm to which it will elongate before breaking when a standard briquette specimen of the material is pulled apart at a specified speed and a specified temperature.

APPARATUS REQUIRED

- i. Standard mould
- ii. Water bath
- iii. Testing machine as show in figure 8.1
- iv. Thermometer - Range 0 to 44°C, Graduation 0.2°C

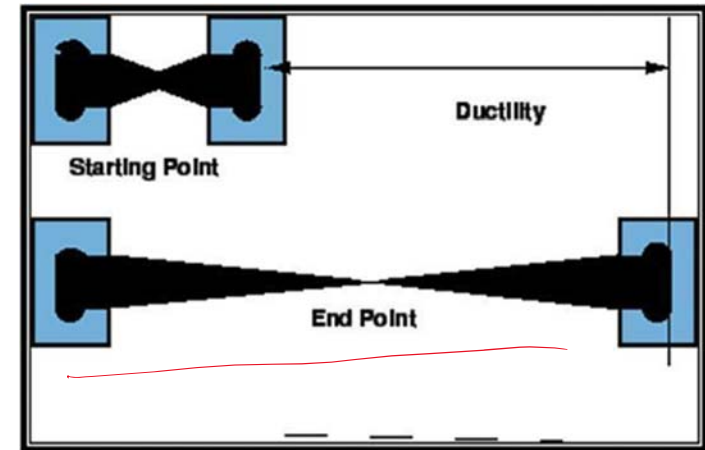


Figure 8.1: Testing machine as show in figure 8.1

PROCEDURE

- i. The bituminous material is tested is completely melt by heating it to a temperature of 75 to 100°C above the approximate softening point until it becomes thoroughly fluid.
- ii. The mould is assembled on a brass plate and in order the material is prevented under test from sticking, thoroughly coat the surface of the plate and the interior surfaces of the sides of the mould with a mixture of equal parts of glycerine and dextrin.
- iii. While filling, the material is poured in a thin stream back and forth from end to end of the mould until it is more than level full. It is leaved to cool at room temperature for 30 to 40 minutes and then it is placed in a water bath maintained at the specified temperature for 30 minutes, after which cut off the excess bitumen by means of a hot, straight-edged putty knife or spatula, so that the mould is just level full.
- iv. The brass plate and mould is placed with briquette specimen in the water bath and it is kept at the specified temperature for about 85 to 95 minutes. The briquette is removed from the plate; detach the side pieces and the briquette immediately.
- v. The rings are attached at each end of the two clips to the pins or hooks in the testing machine and the two clips are pulled apart horizontally at a uniform speed, as specified, until the briquette ruptures.
- vi. The distance is measured in cm through which the clips have been pulled to produce rupture.
- vii. While the test is being done, the specimen both above and below by at least 25mm is covered with water in the tank of the testing machine and the temperature is maintained continuously within $\pm 0.5^\circ\text{C}$ of the specified temperature.

OBSERVATION SHEET:

Room temperature:

Water Bath temperature:

Rate of Pull:

	Test-1	Test-2	Test-3
Elongation Length	100	101	102
Ductility Value	100+		

RESULTS REPORTING

CONCLUSION

