

## **5. FLASH AND FIRE POINT TEST.**

( IS : 1209 – 1978 )

### **INTRODUCTION:**

Bituminous materials leave out volatiles at high temperatures depending upon their grade. These volatile catch fire causing a flash. This condition is very hazardous and it is therefore essential to qualify this temperature for each bitumen grade.

**Flash point:** The flash point of a material is the lowest temperature at which the vapour of substance momentarily takes fire in the form of a flash under specified condition of test.

**Fire point:** The fire point is the lowest temperature at which the material gets ignited and burns under specified condition of test.

### **Object:**

To determine the flash and fire point of bitumen by Pensky-Martens closed tester.

### **Apparatus:**

- a) Pensky-Martens closed tester consist of cup, lid, stirrer device, shutter, flame exposure device.
- b) Thermometer ( 0 – 350<sup>0</sup>C) – sensitivity – 0.1<sup>0</sup>C.

### **Procedure:**

The material is filled in the cup up to a filling mark. The lid is placed to close the cup in a closed system. All accessories including thermometer of the specified range are suitably fixed. The bitumen sample is then heated. The test flame is lit and adjusted in such a way that the size of a bleed is of 4mm diameter. The heating is done at the rate of 5<sup>0</sup>C to 6<sup>0</sup>C per minute. The stirring is done at a rate of approximately 60 revolutions per minute. The test flame is applied at intervals depending upon the expected flash and fire points. First application is made at least 17<sup>0</sup>C below the actual flash point and then at every 1<sup>0</sup>C to 3<sup>0</sup>C. The stirring is discontinued during the application of the test flame.

### **Results:**

The flash point is taken as the temperature read on the thermometer at the time of the flame application that causes a bright flash in the interior of the cup in closed system. For open cup it is the instance when flash appears first at any point on the surface of the material. The heating is continued until the volatiles ignite and the material continues to burn for 5 seconds. The temperature of the sample material when this occurs is recorded as the fire point.

**Limits:** The flash point for all grades of bitumen materials is 175<sup>0</sup>C, minimum.

**FLASH AND FIRE POINT TEST OF BITUMEN  
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Frequency of Tests	Permissible Limits
2 Samples / Consignment	Grade 30/40 Grade 60/70 Grade 80/100
	Flash point : Min.175°C Fire Point : Min.175 + 5°C

Lab Ref. No : \_\_\_\_\_

Date of Sampling : \_\_\_\_\_

Grade of Sample : \_\_\_\_\_

Date of Testing : \_\_\_\_\_

Heating	5°C - 6°C / Min.
Stirring	60 Rev / Min.

S.NO	DESCRIPTION	Test -1	Test -2	Test -3	Test -4	Mean Value
1	Grade of Bitumen					
2	Rate of Heating Time ( Minutes )					
3	Temperature ( °C ).					
4	Flash Point.					
5	Fire Point.					

Remarks : \_\_\_\_\_

Tested by : \_\_\_\_\_  
For Contractor

Checked by : \_\_\_\_\_  
For Contractor

\_\_\_\_\_  
For Engineer