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TESTS ON BITUMEN FELT COVERED ROOF SPECIMENS

by

C. T. Webster

Summary

Spread of flame tests, made in accordance with the proposed British Standard External Exposure Roof Test, on bitumen felt covered concrete slabs are described.

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Fire Research Station,
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Introduction

Bitumen felt is a common covering for concrete roofs and this note describes some tests on the spread of flame on this roof when exposed to radiation representative of a fire from a neighbouring building. Penetration of fire was not considered as the concrete slabs were 2 in. thick and could provide protection for several hours.

Apparatus

The apparatus and test procedure was the same as that described in the proposed specification (1).

Specimens

The bitumen felts, used in the tests conformed to British Standard 747 and are listed in Table 1. These were tested in single double and triple layers and were hot bonded with bitumen to a 2 ft. x 3 ft. 2 in. thick concrete paving slab. In the proposed roof test specification a 3 ft. square concrete slab is required, a 2 ft. wide slab was used in these tests for convenience of handling. This reduction of the width would make little difference to the results for a spread of flame test with these materials.

TABLE 1

BITUMEN FELTS USED IN TESTS

	Reference No. in B.S. 747	Type of Felt	Nominal Weight of felt for 12 yd. x 36 in. roll lb
1	1A	Organic Base Felts Saturated bitumen	25
2	1C	Self-finished bitumen	40
3	1C	Self-finished bitumen	60
4	10	Coated and sanded bitumen	65
		Asbestos base Felts	
5	2A	Saturated bitumen	25
6	2B	Self-finished bitumen	40
7	2B	Self-finished bitumen	30

Results

The results of the tests are given in Table 2.

TABLE 2

SPREAD OF FLAME ON BITUMEN FELT COVERED CONCRETE SLABS

Type of covering	Distance of spread for each specimen inches	Mean distance of spread inches
<u>ORGANIC BASE FELTS</u>		
1 layer of 1C 60 lb. self finished felt	4,6,9	7
1 layer of 1C 40 lb. self finished felt on 1 layer of 1A 25 lb. saturated felt	18,25,21	21
1 layer of 1C 60 lb. self finished felt on 1 layer of 1A 25 lb. saturated felt:	33,27,30	30
1 layer of 1C 60 lb. self finished felt on 2 layers of 1A 25 lb. saturated felt	33,33,33	33
1 layer of 1D 65 lb. coated and sanded bitumen felt on 1 layer 1A 25 lb. saturated felt	27,24,30	27
<u>ASBESTOS BASE FELTS</u>		
1 layer of 2B 30 lb. self finished felt		No spread
1 layer of 2B 40 lb. self finished felt on 1 layer 2A 25 lb. saturated felt		No spread
1 layer of 2B 30 lb. self finished felt on 1 layer 2A 25 lb. saturated felt		No spread
1 layer of 2B 30 lb. self finished felt on 2 layer 2A 25 lb. saturated felt		No spread
1 layer of 2B 30 lb. self finished felt on 2 layers 1A 25 lb. saturated felt		No spread

Discussion of results

The results of the tests show that all organic base bitumen felts conforming to British Standard 747 tend to spread flame when tested in accordance with the proposed External Exposure Roof Test Specification. The distance of flame spread in general increase with increasing amounts of bitumen felt present, but the quantity of bitumen on the roof does not appear to be the controlling factor in the spread of flame. Other tests on wood decks (1) have shown that though there is spread of flame on asbestos based bitumen felts, it is always less than on organic based felts. It appears that inorganic bases in bitumen felt provide the felt with a greater resistance to flame spread than organic bases.

In general it would appear that both the base in the felt and the material on which it rests have a significant influence on the behaviour of bitumen felts on roofs.

The asbestos base felts show no tendency to spread flame even when the amount of bitumen present is increased by the use of more than one layer or by laying on two layers of saturated organic base felt.

Conclusions

Spread of flame tests have been made in accordance with the proposed British Standard External Exposure Roof Test on concrete slabs covered with bitumen felt. The results show that for organic base felts there is some superficial spread of flame increasing with the number of layers of felt used. For the asbestos base felts that were tested there is no spread of flame even with more than one layer of felt.

Reference

1. WEBSTER, C. F. The development of a roof test (Report in preparation).