



## HOME OFFICE

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26 May 1970

21/1970

Dear Chief Fire Officer

## EXPANDED POLYSTYRENE CEILING TILES

Some concern has been expressed by fire brigades, local authority associations and other bodies over the past 2 or 3 years about the possible fire hazard presented by expanded polystyrene ceiling tiles and wall linings, and reports have been received of instances in which fire spread is believed to have been particularly rapid on walls and ceilings to which such tiles and linings have been fixed. In addition, it has been suggested that molten burning droplets of polystyrene falling from ceilings have caused fires to spread more quickly by igniting inflammable materials onto which they have fallen.

2. When we discussed this matter with the Joint Fire Research Organisation and the Ministry of Housing and Local Government, doubts were expressed about the suitability of the available methods of test for assessing the inflammability of expanded polystyrene tiles and it was decided that further investigations would have to be carried out before any firm conclusions could be reached about the degree of risk presented by the "Normal" and "Self-extinguishing" grades of material. The Joint Fire Research Organisation agreed to undertake these investigations, using tests which would simulate as closely as possible the actual circumstances in a home in which expanded polystyrene tiles were used on the walls and ceilings, and exposing the tiles to sources of ignition of the kind likely to occur in the home.

3. These investigations have now been completed and the results have been made known to us and will be published by JFRO in due course. Tiles of both the "Normal" and "Self-extinguishing" grades have been tested both in their original unpainted state and also coated with various types of paint. Tests were carried out on tiles secured by both the "blob" and overall application of adhesive. The behaviour of wall linings covered with wallpaper was also tested.

4. These tests have shown that, provided that the tiles are not coated at any time with gloss paint, they do not, if a fire occurs, help it to spread to any significant extent. When, in the course of the tests, flames reached ceilings covered with unpainted tiles or tiles coated with water-bound emulsion paint, some burning of the tiles immediately above the flames took place but the spread of flame across the ceilings was limited, and was largely confined to the area within the reach of the flames from the igniting source. Any molten burning droplets of polystyrene which fell from the ceilings came from this same area and it may be concluded, therefore, that in an actual fire, they would fall on to those parts of the room which were already burning. No significant difference was detected

between the burning behaviour of "Normal" and "Self-extinguishing" grade tiles. The performance of tiles secured in position by an overall application of adhesive was marginally better than that of tiles fixed by dabs of adhesive. It was found that expanded polystyrene linings on walls whether or not they are covered with wallpaper, do not increase the rate of spread of fire and do not present a serious fire risk.

5. The tests have revealed, however, that if expanded polystyrene tiles are coated with a gloss paint, the paint film will become detached and burn fiercely if a fire starts and will cause a very rapid spread of flame across an entire ceiling with flaming pieces of paint falling on to the floor below.

6. Most gloss paints are incompatible with polystyrene and it is not therefore practicable to use such paint as a first coating on polystyrene tiles. Emulsion paint is usually used for this purpose. But it is subsequently possible to use a gloss paint on top of emulsion paint and some people may well do this on kitchen and bathroom ceilings in order to provide a surface which can be wiped.

7. The findings of the JFRO tests have been reported to and considered by the Joint Fire Prevention Committee and, after taking account of the Committee's comments, the Home Office decided to issue a public warning to the effect that gloss paint should not be used on polystyrene tiles and that only fire-retardant or emulsion paint should be used for this purpose. A copy of our Press Notice, which was issued on 25 March, is enclosed. It was our intention to write to you before proceeding with this but circumstances arose at very short notice which made it necessary for us to issue it without delay.

8. As regards tiles which have already been painted with gloss paint, the recommendation will be that these should be taken down. The JFRO tests have shown that overpainting with emulsion or fire-resisting paint does not eliminate the hazard. While tiles secured by an adhesive applied over the whole of their surface gave only a marginally better performance in the tests than those secured by blobs of adhesive, it seems preferable that the dab method of application should not be used in future. This was mentioned in our Press release.

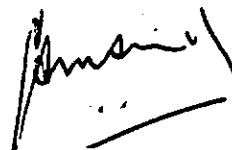
9. I should be most grateful for your co-operation in giving local publicity to the potential danger which may arise if, at any time, expanded polystyrene tiles are painted with a gloss paint. We also propose to seek the help of the safety organisations and local home safety committees in order to ensure that the warning is given wide and continuing publicity. We also have it in mind to make a television filler film on this subject.

10. We have already had informal discussions with the trade associations representing the manufacturers of paint, adhesives and expanded polystyrene tiles about the results of the JFRO investigation with a view to seeking their co-operation in this matter. They seem to be very willing to help. We now propose to have further consultations with these associations as to:-

- i. the inclusion of a suitable warning in or on cartons in which expanded polystyrene tiles are sold to the effect that only emulsion or fire-retardant paint should ever be used on the tiles; and
- ii. discontinuation of the production of blob adhesives.

The results of the JFRO investigations have created some doubt as to whether or not there is a continuing need for 2 different grades ("Normal" and "Self-extinguishing") of expanded polystyrene tiles for domestic use. This matter will, no doubt, be considered by the appropriate technical committee of the British Standards Institution.

Yours sincerely

A handwritten signature in black ink, appearing to be 'P. Smith', written over a horizontal line.

No. 21/1970

FIRE HAZARD PRESENTED BY  
EXPANDED POLYSTYRENE TILES

The Home Office strongly recommends that gloss paint should never be used on expanded polystyrene tiles in view of the considerable fire risk which this has been shown to present, and that only fire-retardant or emulsion paint should be used for this purpose.

This hazard cannot be removed by overpainting with emulsion paint or a fire-retardant paint. Tiles already painted with gloss paint should, therefore, be removed.

Tests by the Joint Fire Research Organisation have shown that, if expanded polystyrene tiles are painted with gloss paint, the paint film will become detached and burn fiercely if a fire starts and will cause a very rapid spread of flame across an entire ceiling with flaming pieces of paint falling on to the floor below.

Most gloss paints are incompatible with polystyrene and it is not therefore practicable to use such paint as a first coating on polystyrene tiles. But it is possible to use paint of this kind on top of emulsion paint and it is tempting to do this on kitchen and bathroom ceilings in order to provide a wipeable surface.

The tests simulated as closely as possible the actual circumstances in a home with tiles used on ceilings and exposed the tiles to sources of ignition of the kind likely to occur in the home. Tiles of both the "Normal" and "Self-extinguishing" grade

were used and they were tested both in their original unpainted state and also when coated with various types of paint. Tests were carried out on tiles secured by both the "blob" and overall application of adhesive. The behaviour of wall linings covered with wallpaper was also determined.

The tests have shown that, provided that the tiles are not coated at any time with gloss paint, (a) they do not, if a fire occurs, help it to spread to any significant extent: when, in the course of the tests, flames reached ceilings covered with unpainted tiles or tiles coated with water-bound emulsion paint, some burning of the tiles immediately above the flames took place but the spread of flame across the ceiling was limited, and was largely confined to the area within the reach of the flames from the igniting source; (b) no significant difference was detected between the burning behaviour of "Normal" and "Self-extinguishing" grade tiles; (c) the performance of tiles secured in position by an overall application of adhesive was better than that of tiles fixed by dabs of adhesive; (d) expanded polystyrene linings on walls, whether or not they are covered with wallpaper, do not increase the rate of spread of fire (provided, of course, that they are not painted with gloss paint).

Consultations are in process with the trade associations representing the manufacturers of paint, adhesives and expanded polystyrene tiles as to:-

- (i) the inclusion of a suitable warning in or on cartons in which expanded polystyrene tiles are sold to the effect that gloss paint should never be used on the tiles;
- (ii) discontinuation of the production of blob adhesive.

Tiles (which have not been painted with gloss paint) give a slightly better performance when secured by an adhesive applied over the whole of their surface than when secured by blobs of adhesive. It is therefore preferable that the dab method of application should not be used.

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25th March, 1970

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**The Fire Service  
College**



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