

## Flammable Solids & Dusts

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### FIRE HAZARDS OF CARPET AND CARPET UNDERLAY

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#### Summary

We have used for some years the medium scale room test described in booklet HSG 64 as the basis for assessing the risk from flammable solids stored in bulk. Most of the products that are classified as high risk by either of the two criteria are either foamed plastics or textiles of some kind. Despite the fact that carpet and carpet underlay incorporate both foams, and textiles, we have had until recently, no data on the fire hazards of these common materials.

#### Background

The common experience of the fire brigade is that when laid flat on the floor, carpet and underlay contribute little to fire growth. Flame spread across the surface is not rapid, and often after a significant room fire, the floor coverings are incompletely burnt. Clearly the situation is different if the floor coverings are stood in rolls on their ends, or stored as horizontal rolls on racking. This situation may be found in a diverse range of premises, such as the factories where the floor coverings are made, wholesale premises and large retail shops which can have very substantial inventories, and during the fitting out stage of the construction of large buildings such as hotels, shops or places of assembly.

HSL at Buxton have tested 6 types of flooring materials used in large contract jobs. They were two types of underlay, one type of foam backed carpet, and two types of carpet intended to be used with an underlay. Each was tested in the medium scale room, with the roll in both a horizontal and vertical orientation. The results are attached as table 1. The ignition source was the usual no 7 wooden crib developed for testing furniture.

#### Results

The results can be summarised by 3 conclusions:

- the foam underlay and foam-backed carpet samples all burnt to produce sufficient smoke to classify the material as a high hazard flammable solid, whether the roll was stood horizontally or vertically.
- Low density foam underlay also showed exceptionally high fire growth rate, as high as any material previously tested. It was also very sensitive to ignition.
- Traditional wool/nylon carpet with a hessian base burnt comparatively slowly, and by both parameters the material was even less of a risk when stored as a horizontal roll.

In factory premises, where foam underlay or foam backed carpet is produced, it should be regarded as a high risk flammable solid unless the occupier has shown through tests that this is not the case. Process precautions to control this risk will include high standards of control over ignition risks, limitations where practical on quantities in the workroom, and fire separation between process and storage.

In wholesale premises and retail shops, HSE is unlikely to be involved, and questions of fire safety should normally be referred to the fire brigade. The relevant information is being passed to the Home Office so that they can make it available to Fire Authorities.

The demarkation of responsibility between HSE and fire authorities in buildings under construction, refitting or alteration is described in **OC 401/3 'Enforcement of fire safety standards during construction work'**. Where process safety inspectors in FCGs are asked for advice on the fire risks associated with a construction activity, temporary storage of floor covering materials during the later phases of construction should be considered. It will usually be appropriate to require such materials to be kept out of stairwells and circulation places, preferably in a room set aside specifically for the purpose. The room door should normally be kept locked.