

PLASTICS PACKAGING MANUFACTURER

Supposed cause: Defective electric motor overheating, igniting plastics.

A modern factory was virtually destroyed by a fire which grew undetected for at least ten hours. The premises, which were located on an industrial estate, comprised a single-storey factory unit (50 m x 35 m) with a small two-storey office section. They were used for the manufacture of plastic air-bubble cushioning used for packaging. The steel-framed building had low-rise breezeblock and metal-clad insulated walls under a shallow pitched asbestos-sheet roof.

Work finished for the weekend at 1130 hours on Saturday 16 August 1987. The premises were secured and all appeared in order at that time. In the early hours of the following morning a policeman on car patrol discovered a large fire involving the building and its contents. A fire call was relayed to the fire brigade control via police control at 0319 hours, and three minutes later the first crews and appliances were at the scene. Smoke was issuing from all four walls, and the roof and the building were beginning to show slight signs of fire and heat stress.

Visibility was extremely poor and the factory interior was entirely smoke logged with thick black smoke. There were several dull explosions in the upper reaches of the building, indicating that the fire was breaking through the roof. ...The roof began to collapse, releasing a column of smoke some 12 metres wide by 30 metres high. The steel trusses buckled and the external metal cladding on the walls began to distort. The plastic packaging inside the building was burning fiercely. Two violent explosions were then heard as the mains gas supply became involved.

As the plastic in the building was consumed and the extra jets were brought on stream, the firemen were able to surround the fire. Finally, at 0533 hours, they had it under control. The investigation into the cause of the fire was extremely difficult due to the degree of damage in the factory. There were two main areas of damage. One was in the vicinity of the mains gas supply, but the most severe damage was in the vicinity of the compressors which controlled the ventilation. It was in this second area that the fire was presumed to have started. Though conclusive evidence could not be found, it was thought that a defect in the compressor motor could have resulted in overheating. There were large quantities of plastic packaging in the vicinity and this could have ultimately been ignited. The fire was a slowburning one initially.

FRAME risk assessment.

In smaller factories, one of the main risks is a fire that starts outside working hours and burns for several hours before it is detected. The report gives no information on the fire safety aspect during working hours, so the FRAME calculation was made for the "idle hours situation". The nonworking situation was introduced in the calculation by assimilating the factory with a storage area. However, the main negative element in this report, i.e. the combined presence in the same space of a high fire load of easily ignitable plastics and a continuously working heating and ventilation system, still results in a moderate value for the "activation factor a" , but the lack of detection and alarming is the weak point of the protection. The resulting values for $R = 2.31$ and $R_2 = 1.96$ indicate that a total loss could be expected.