

PASSIVE AND REACTIVE FIRE PROTECTION TO STRUCTURAL STEEL

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This Information Paper collates and updates available information on passive and reactive fire protection to structural steelwork. It is intended for use by those responsible for specifying fire protection, main contractors, building control authorities and installers. It provides information on the options available to the designer, ranging from the use of unprotected steelwork to the selection of products for extreme events such as hydrocarbon fire exposure. The Information Paper covers the types of product available, issues around the specification of fire protection to structural steelwork, the advantages and disadvantages associated with each type of product in relation to the construction process, technical performance in tests and how this relates to performance in real fires, and the importance of third-party certification schemes for manufacturers and installers of fire-protection systems.

BACKGROUND

The market for fire protection to structural steel has changed beyond recognition over the last 20 years. The cost of fire protection has reduced year on year due mainly to the high levels of competition in the industry driving research and innovation. Traditional fire-protection materials such as insulating boards, spray protection materials, flexible blankets and concrete encasement are passive in that, upon application, they inherently possess the required insulation (subject to curing). Reactive systems are those whose insulating properties are developed during a fire. Intumescent coatings are the most common example of a reactive system. Intumescent coatings have come to dominate



Figure 1: Damage to unprotected steelwork following a large-scale fire test

the market in the UK, partly because the development of off-site intumescent allowed economies of scale. The development of water-based technologies in the late 1990s significantly reduced the thicknesses and costs of such coatings. However, there have been questions over the reliability of some of the products used and the quality of on-site application. Results from standard fire tests and from the limited number of natural fire tests undertaken suggest a wide variability in the performance of intumescent coatings. In order to address this issue, intumescent coating manufacturers who are members of the Intumescent Coatings Forum have voluntarily committed to a programme of independent product testing and third-party certification.

There is already a great deal of information available in relation to the fire performance of structural steel and the advantages and disadvantages of proprietary fire-protection products. However, much of this information is either outdated or commercially motivated. This Information Paper is intended to be an independent and impartial source of reference, and a guide to sources of detailed information related to the fire protection of structural steel.



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