



# **Copper Residential Sprinkler Systems for Life Safety & Property Protection**



**Studley Green, Trowbridge, Wiltshire**

**Copper Development Association**  
Publication 147

**When the Studley Green housing estate became due for refurbishment decisions had to be made regarding the provision of fire safety measures for the tenants. Wiltshire Fire Brigade suggested residential sprinklers might be an answer to the problems of property loss, and possible deaths and injuries, due to fires.**

The sprinkler protection being installed in 212 properties at Studley Green, Wiltshire is the first large-scale installation of residential sprinklers in a social housing project in Europe. The sprinkler protected homes form one part of a £10million project to redevelop the pre-cast reinforced concrete former Council properties on the Studley Green estate.



The sprinklers were specified, designed and installed by the purposely formed West Wiltshire Residential Sprinkler Partnership whose aim is to provide fire sprinkler protection in 212 new homes on the estate near Trowbridge. The Partnership includes the Residential Sprinkler Association, Alfred McAlpine Partnership Housing Limited and local Council, Housing Society, Fire Authority and Tenants Associations.

Installation of the systems has been undertaken by Actspeed Limited and Nimbus Fire Systems Limited who began work on the first of the properties in February 1999. The homes range in size from bungalows to six bedroom houses. A number of retrofit systems were required for the first phase of the project, which used copper tube and fittings for the sprinkler system pipework. Costs for systems should be on a case by case basis, although for a typical semi-detached property costs are likely to be in the region of £1,500.



*Nick Ross, John Craig (Chief Fire Officer Wiltshire Fire Brigade) and Sir George Pigot (Residential Sprinkler Association) at the official opening.*

The official launch of the residential sprinkler project took place in June 1999 and the gathered guests and tenants heard speeches from Nick Ross, BBC TV 'Crimewatch', and Graham Meldrum, HM Chief Inspector of Fire Services.

Nick Ross said: "I think it is possible that we may be witnessing today not just the opening of one home on an estate but something that will become a pattern of all new housing across the country."

Graham Meldrum said: "This event is very much part of one of the aims of the Home Office – to reduce the number of people killed or injured in fires."

Following the handing over of the first home to Mark and Michelle Hall a demonstration of the efficiency of residential sprinkler systems was held in one of the properties due for demolition.

The sprinkler system is designed to control the fire, and in many instances will extinguish the fire. Fire damage in the sprinklered room, as can be seen, was restricted to a small area of the sofa whilst



the unprotected room was completely burnt out. It is also worth bearing in mind that the water used by the sprinklers in controlling and extinguishing the fire was considerably less than the water used by the Brigade in fighting the fire in the unprotected room.

Sprinklers will activate when the fire is small and will discharge water at flow rates of, typically, 60 litres/min which will be sufficient to control a developing fire. A flow rate of 60 litres/min could control fires of 0.84MWatts (MW) in size. To give an idea of the value of sprinklers, a fully developed fire in an upholstered chair can produce in the region of 2.0MW of heat and in a two-seater sofa 3.0MW. Fires of this size may require water flow rates of around 150 litres/min and 215 litres/min respectively to control.

## System Design

British Standards Institution has issued a Draft for Development, DD251 – Sprinkler systems for residential and domestic occupancies – Code of practice. This specification gives recommendations and guidance on the design of residential sprinkler systems, giving details on consultation, design, installation, commissioning, documentation, maintenance and testing.

Manufacturers of sprinkler heads produce many different designs, with different flow characteristics. Concealed sprinkler heads are ideal for residential properties as they have a minimal visual impact on the room. Each sprinkler head design is tested in a laboratory to determine the flow and spray coverage characteristics. This information is then used by the sprinkler system designer to select an appropriate head design for the water pressure available and the area to be protected.

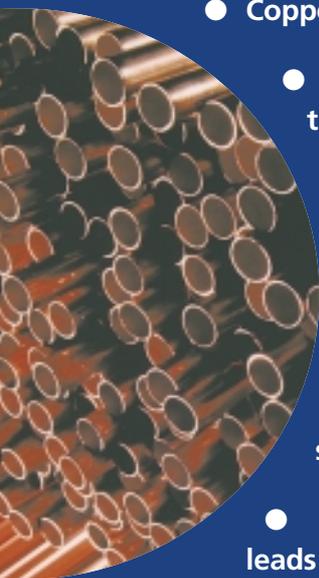
Sprinkler protection is recommended throughout the habitable parts of each property. Statistics show that 89% of dwelling fires are confined to the room of origin, thus only one or two sprinkler heads would operate in a fire scenario.



## The Pipework

Copper is the ideal choice for pipework in domestic and residential properties for all the same reasons that it is used for the cold and hot water services.

- Copper tube has a proven ability to transport water around homes.
- Copper pipework can be quickly and neatly joined using either soldered joints or the new copper push-fit and press-fit fittings.
- The ease with which joints of all kinds can be formed is a distinct advantage when space is limited.
- Purpose made tube bends can be used to reduce the pressure losses in the pipework.
- The lightness of copper and its rigidity make it easy to install in confined spaces and means relatively few hangers and supports for straight pipe runs.
- Copper has excellent corrosion resistance to atmosphere and water and this leads to a long maintenance-free installation life.



## 1998 Statistics

The Fire Statistics United Kingdom 1998 can show us where the dangers lie.

<b>Total Building fires</b>	<b>112,400</b>	The main cause of fatalities in dwelling fires is carelessness with hot substances, including smoking materials, accounting for 32% of deaths.
<b>Dwelling fires</b>	<b>70,700</b>	
<b>Dwellings – Estimated deaths</b>	<b>489</b>	It should be noted that 82% of households in the UK are equipped with smoke detection and that only 13% of the dwelling fires were discovered by smoke alarms.
<b>Dwellings – Non-fatal casualties</b>	<b>14,900</b>	
<b>Main causes of accidental fires</b>		
<b>Misuse of equipment</b>	<b>16,400</b>	The residents of the 212 sprinkler protected properties at Studley Green can rest easy in the knowledge that should fire break out in their home the sprinkler system will tackle the fire in its initial stages, buying the occupants valuable escape time, prior to the arrival of the Fire Brigade.
<b>Chip pan</b>	<b>12,300</b>	
<b>Faulty leads</b>	<b>8,400</b>	
<b>Things too close to heat source</b>	<b>4,900</b>	

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