

Wall Ties - History and Background

Cavity walls incorporating metal ties have been in use since the beginning of the nineteenth century but it was the 1930s building boom that produced large numbers of cavity construction dwellings. From 1945 cavity wall construction became the normal for houses and many other buildings.

The early metal ties, produced mainly from wrought or cast iron, performed satisfactorily but in more recent years mild steel ties have been used and, despite galvanising or bitumastic treatments, have been found to suffer from corrosion. A British Standard was produced in 1945.

The estimated life of these mild steel ties is appreciably less than the 60 year life expected. The 1945 standard was relaxed in 1964 and 1978 but in 1981, when the extent of the problem was registered, the British Standard was amended to triple the zinc coating thickness on a wire tie.

A number of cases of distress of cavity walls, attributable to wall tie failure, have occurred in the United Kingdom and it is now clear that the problem could eventually affect all the cavity walled structures built before 1981, some 10 million dwellings, and will not, in future, be confined only to cases of poorly made ties.

Wall tie failures reported to the Building Research Establishment (BRE) include inferior coatings of bitumen, insufficient zinc galvanising on mild steel, aggressive mortars (particularly black ash), exposure to marine climates and permeable mortars such as lime that permits rapid carbonation.

It is estimated that over 3 million houses of cavity wall constructions were built before the introduction of the 1945 standard. Between 1945 and 1964, an additional 3 million houses were built to the British Standard BS 1243-1945 with a wire tie life expectancy of 15 to 31 years and a strip tie life expectancy of 31 to 61 years. From 1964 to 1986 over 4 million houses were built to the lower British Standard with a tie life expectancy of 23 to 46 years.

It was estimated, in the 1986 Survey of English Houses, that around 12 million properties exist with cavity walls, of which the number requiring some repairs to wall structures is approaching one million.