

## Appendix 4 Fragility: Tests and specifications

1 There is now a widely accepted standard of performance within the UK to define what a 'non-fragile profiled sheeted roof' is. The test to show non-fragility for a roofing assembly has been drawn up by the Advisory Committee for Roofsafety (ACR) and is published in *Test for non-fragility of roofing assemblies*.<sup>16</sup>

2 UK manufacturers of profiled roofing sheets are aware of the performance requirements of the ACR non-fragility tests and have designed their products for the industrial, commercial and agricultural roofing markets such that, when fully fixed to their fixing requirements, the roof assembly will be non-fragile. The advent of the ACR test has seen a dramatic improvement in the technical performance of all industrial profiled sheeting in the last ten years.

3 There are three categories to passing the ACR test:

**Non-fragile Class C:** The roof assembly retains a dropped load after one drop but fails to retain the load on the second drop. This is the minimum standard now accepted for a non-fragile roof. In practice, this means that if someone slipped and fell on to a Class C roof, it is likely that they would damage the roof such that it would need repairs to maintain weather resistance and a non-fragile status.

**Non-fragile Class B:** The roof assembly retains a dropped load after two drops. In practice, this means that a person could fall twice in the same area and the roof would still support their weight. However, Class B means that damage will have been done to the roof that may impair long-term weather resistance and reduce the time that the non-fragile status is maintained.

**Non-fragile Class A:** The roof assembly retains a dropped load after two drops and there are no signs of any damage to the roof assembly that will affect the roof's long-term weather resistance.

4 The ACR test is a demanding test with good safety factors built in. A Class C performance is fully acceptable as a standard of non-fragility. A Class B rating will normally be achieved with profiled metal assemblies and profiled roof lights. A Class A rating is unlikely to be achieved using normally accepted profiled materials. A Class A rating would typically be required where vehicle access was required on the roof.

5 Achieving a non-fragile roof, including all roof lights, at the construction phase is now commonplace and anything less should not be accepted.

6 However, as non-fragile roofs become more common, there is a serious risk that roof workers become complacent and do not recognise that a non-fragile roof will, at some point in time, become fragile. Fragility will eventually occur for one or many of the following reasons:

- the fixings were badly fixed leading to excessive wear around the fixing;
- the fixing washers have failed due to overtightening, leading to sheet and fixing corrosion;
- the protective surface of the profiled sheeting was damaged by foot traffic during construction or during the roof maintenance phase, which will lead to an early failure of the sheet's performance;
- any slip or fall on to the roof may damage the assembly, which could lead to early corrosion failure;
- external atmospheric conditions could lead to early failure of the sheet's performance, eg saline or factory process;
- the sheets and fixings have reached the end of their design life; and/or
- if a roof was built before 2000 it may well have been fragile when constructed.