

ACR(M)001:2005 - 'Test for Non-Fragility of Profiled Sheeted Roof Assemblies'

In an effort to reduce the numbers of people falling through roofs the HSE CDM Regulations recommend that fragile roofs should be avoided and that all new or refurbished roofs should be made non-fragile.

The term non-fragile signifies that a roofing panel or rooflight should be strong enough to stop personnel falling through them on impact.

Test Background

For the purpose of designing the structure which supports them, roofs are assigned loads to be supported. These loads are static loads.

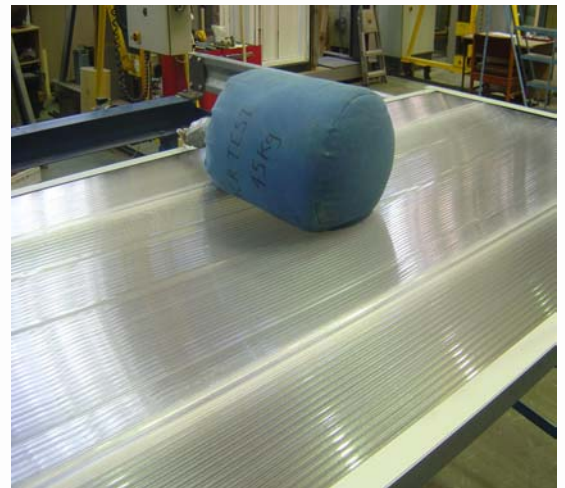
However, these static loads do not account for the fact that people who walk across roofs may stumble and fall onto them, applying an instantaneous load which may be much greater than the static loads prescribed for the roofs. Under these types of impact, roofs have failed, allowing the person to fall through and suffer serious injury or death.

The situation became intolerable and a solution had to be found. To provide this solution, the Health and Safety Executive undertook research, which allowed the magnitude and distribution of the instantaneous force to be quantified. This data led to the development of a test which represented a human impact incident on a surface reasonably accurately. The test, ACR(M)001:2005 'Test for the Fragility of Profiled Sheeted Roofing Assemblies', is carried out on a complete roof assembly and checks whether the roofing surface can support, without catastrophic failure, the loads that will be applied by a person falling onto it and is applicable to any surface, wherever it is.

Test Procedure

The test procedure involves dropping a 300mm diameter 45kg bag twice from a height of 1.2m onto a roofing assembly. From this a number of Classifications are defined depending on the strength and resilience of the assembly.

- If the bag passes through the assembly on the first drop, the roofing is classified as **fragile**.
- If the bag is successfully retained by the assembly for a period of 5 minutes after one drop, it is classified as **Class C non-fragile**.
- If the bag is retained for a further 5 minutes after two drops at the same point of impact as the first drop it is classified as **Class B non-fragile**.
- If there is no significant damage to the assembly after two drops, the roofing can be classified as **Class A non-fragile**.



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Test Results

The Rockwell Kappa and C4/25mm glazing systems were independently tested by the BRE during October and November 2007. Both systems were tested with 3mm thick glazing channels over single and multiple spans, with purlins positioned at 2m centres. Both systems achieve Class B non-fragility ratings for each spanning configuration tested.

Glazing System	Sheet Thickness & Type	Channel Thickness	Span	Min no. of intermediate supports	Max span between supports	End panels max width	ACR(M) 001:2005 Rating
Kappa	10mm Triplewall	3mm	Single	n/a	2000mm	250mm	Class B
Kappa	10mm Triplewall	3mm	Double	1	2000mm	250mm	Class B
Kappa	10mm Triplewall	3mm	Triple (or more)	2	2000mm	250mm	Class B
C4/25	25mm Fourwall	3mm	Single	n/a	2000mm	250mm	Class B
C4/25	25mm Fourwall	3mm	Double	1	2000mm	250mm	Class B
C4/25	25mm Fourwall	3mm	Triple (or more)	2	2000mm	250mm	Class B

Copies of the official test reports are available on request.

Note:

Roofing products in use are subjected to a wide variety of conditions, e.g. weather, internal atmospheres, varying degrees of structural loads, misuse etc. Therefore, the results shown above for the Kappa and C4/25 glazing systems only should be considered as that product's performance under test at the time of the test. It should be borne in mind that the product's properties may change during its service life.



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