Technical Note No 52

Impact performance of cladding

Introduction

Facades may be subject to impact during normal use. They must be able to resist such impacts without causing safety hazards. Damage affecting serviceability should also be minimized but may be accepted where components are readily replaceable.

Materials such as masonry and concrete are robust and can generally be expected to resist normal impacts however many materials used in modern facades are more susceptible to damage and require testing to assess their performance.

This Technical Note reviews the need for impact testing of walls under typical UK conditions. The impacts considered are generally horizontal and the guidance is considered applicable to surfaces within 15º of vertical. At greater slopes performance requirements may be modified based on the perceived risk of impact. Additional considerations may apply in particular locations. Examples include resistance to wind blown debris in areas affected by hurricanes, resistance to sustained attack and vehicle impacts.

Technical Note 42 gives guidance on impact requirements for glass roofs resulting from maintenance activities at roof level but more severe impacts from objects dropped from greater heights are not included. Impacts considered in Technical Note 42 are vertical arising from falling people and objects.

A summary of recommendations and test methods for impact resistance of building components is given in Appendix A.

Types of impact

Hard and soft body impacts

The building envelope may be subject to impact from a variety of causes. Walls are required to be resistant to impact from soft bodies, principally people, which deform on impact to distribute the load, and from more rigid objects referred to as hard bodies. Hard body impacts are generally considered to have lower impact energy than soft body impacts but hard body impacts from access equipment, skateboards etc could be at higher levels of impact energy. Hard body impacts tend to cause failure by localised punching whereas soft body impacts tend to cause failure by generalised bending. For this reason hard impacts can be damaging even at low impact energy.

Serviceability impact

It has been UK practice to require serviceability under impact. Following a serviceability impact test there should be no loss of performance. Damage of an aesthetic nature such as indentations on metal panels may be acceptable depending on the severity of the damage, the nature of the material and location of use.

In some cases it may be impractical to achieve this level of performance with the chosen construction but the loss of performance can be reduced. An example is the use of glass facades where it is difficult to prevent glass breakage but it is possible to use a glass which remains secure and weathertight.

Safety impact

The building envelope may be subject to more severe accidental impacts which it is unreasonable to resist without damage but where the consequences for the safety of