Technical Note No. 9

TESTING PRESSURES

Introduction

Cladding systems and components are routinely tested to determine properties such as resistance to wind load, airtightness and watertightness. However, the pressures used for these tests are often different, and it is easy to become confused as to the purpose of these tests.

This technical note aims to explain the normal procedure for determining test pressures, and to give guidance on the applicability of test results.

Site wind loading

The key performance criteria for designing any cladding system is the windloading that is likely to be experienced at the particular location. Windload is determined by following the procedures in BS 6399: Part 2. Normal practice is to determine the wind load based on a 5m diagonal dimension (a typical distance between cladding fixings), that will occur just once, on average, in any 50 year period. This wind load is then often rounded up, typically to the nearest 400Pa, and a minimum wind load of 800Pa is required by CWCT (CWCT, 1996).

Rounding-up of wind load is aimed at manufacturers of standard components or systems, such as windows, which are more cost-effective if they are designed and tested to some target value.

Stating the actual site wind load, and testing at pressures other than 800, 1200, 1600 and 2000Pa, is usually only cost effective where the majority of the cladding system is being tailored to the particular building (bespoke cladding) and design savings can be made.

In either case the wind load stated by the specifier is the **design wind load**, i.e. that value which the cladding must be designed to resist.

Wind load testing

Testing for resistance to wind load is divided into two basic elements - serviceability testing and safety testing. Separate positive and negative wind load test pressures can be applied if the design wind load has different positive and negative magnitudes (negative wind pressure is normally the greatest). This (again) is particularly appropriate when testing bespoke cladding.

Serviceability wind load testing

For a serviceability wind load test a component or sample of the cladding is subjected to both positive and negative pressure differentials equal to the design wind load, to ensure that when the 1-in-50-year wind load occurs the cladding system or component neither fails (by moving too much - this assessment is usually deflection limited) nor ceases to be weathertight.

The deflection of parts of the component or system are monitored and compared to pre-defined limits. An excessive deflection may lead to damage to fixtures and fittings, failure of joints, or may simply be unnerving for the occupants of the building.

The serviceability test is always followed by a repeat of the tests for air and watertightness, to