Technical Note No 57

Cladding movement

This Technical Note is one of a series of three describing the design and assessment of supporting structures and cladding systems to ensure that building envelopes are serviceable throughout their design life. The series comprises:

TN 55 Movement accommodation in building envelopes
TN 56 Accommodation of structural movement
TN 57 Cladding movement

This Technical Note should also be read in conjunction with:

TN 21 Tolerance, fit and appearance of cladding

Introduction

This Technical Note describes the causes of movement of cladding components and the likely magnitude of any movements.

It also describes mechanisms for accommodating movement of cladding components.

Component movement

Components may move as a result of:

- Applied load
- Temperature
- Moisture

Applied loads cause deflections of infill panels and framing members. Movement may lead to unintended contact of components causing direct damage or different load paths and stresses. Differential movement of adjacent components may lead to joint failure through tension, compression or shear on a sealant or gasket joint or reduction in width of an open joint.

Limits to the deflection of components due to load are given in CWCT 'Standard for systemised building envelopes'.

Temperature and moisture change are greatest for external components of the building envelope but may also affect internal components.

Uniform changes in temperature or moisture will cause the component to expand or contract uniformly. However, temperature and moisture changes often vary through the thickness of a component and over the surface of a component as a result of shading or protection from weather.

Non-uniform changes lead to differential expansion that causes changes of shape (bowing, dishing and warping), or complex internal stress fields.

Differential movement of adjacent components may impair joint performance.

Temperatures and moisture movements commonly experienced in the UK are given in BRE Digests 228 and 229.

Movement under load

Framing members will deflect in plane when subjected to self-weight loads of the