

Fundamentals of heat transfer

Supersedes Technical Note 46

This Technical Note is one of six on the thermal performance of building envelopes. The series comprises:

- 106: Fundamentals of heat transfer
- 107: Thermal transmittance (U-values) for built-up walls
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- 109: Thermal bridges within SAP and NCM
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- 111: Designing building façades to manage the risk of interstitial condensation

Introduction

- 1 This Technical Note is an update to TN46, superseding that Note.
- 2 This Technical Note introduces the reader to the relevant standards and basic principles of heat transfer that are required to understand the contribution that building envelopes can make to the construction of energy efficient buildings.
- 3 Information is given on heat transfer mechanisms, material properties and general calculation principles.

Relevant Standards

- 4 A list of relevant standards and guides is presented below.
 - BS EN ISO 13788, Hygrothermal performance of building components and building elements — Internal surface temperature to avoid critical surface humidity and interstitial condensation — Calculation methods
 - BS EN ISO 13789, Thermal performance of buildings — Transmission and ventilation heat transfer coefficients — Calculation method
 - BS EN ISO 6946, Building components and building elements — Thermal resistance and thermal transmittance — Calculation method
 - BS EN ISO 7345, Thermal insulation — Physical quantities and definitions
 - BS EN ISO 10077-1, Thermal performance of windows, doors and shutters — Calculation of thermal transmittance — Part 1: General
 - BS EN ISO 10077-2, Thermal performance of windows, doors and shutters — Calculation of thermal transmittance — Part 2: Numerical method for frames
 - BS EN ISO 10211, Thermal bridges in building construction — Heat flows and surface temperatures — Detailed calculations
 - BS EN ISO 12631, Thermal performance of curtain walling — Calculation of thermal transmittance