Technical Note 108

Thermal bridges (Psi and Chi values)

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
108: Thermal bridges, Psi and Chi values
109: Thermal bridges within SAP and NCM
110: Designing building façades to manage the risk of surface condensation and mould growth
111: Designing building façades to manage the risk of interstitial condensation

Introduction

1   This Technical Note discusses the calculation methods for determining the thermal performance of thermal bridges in built-up walls. See TN48 for determining the performance of windows and TN49 for curtain walls.

Relevant Standards

2   Relevant standards can be found in TN106.

Notation

Symbol	Quantity	Unit
A	Area	m^2
C_p	Specific heat capacity	J/kg·K
H	Heat transfer coefficient	W/K
Q	Heat flow	W
d	Thickness or depth	m
T	Temperature (absolute scale)	K
θ	Temperature (Celsius)	°C
ε	Emissivity	-
q	Rate of air leakage	m^3/s m^2
ρ	Density	kg/m^3
p	Pressure	Pa
L	Thermal conductance, overall	W/K
$\Re$	Thermal resistance, overall (1/L)	K/W
U	Thermal transmittance (over an area)	W/m^2·K
R	Thermal resistance (over an area) (1/U)	m^2·K/W
λ	Thermal conductivity	W/m·K
r	Thermal resistivity (1/λ)	m·K/W
Ψ	Linear thermal transmittance	W/m·K
χ	Point thermal transmittance	W/K

Table 1: Notation