

## Thermal bridges within SAP and NCM calculations

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

### Introduction

- 1 This Technical Note introduces the basic principles associated with incorporating thermal bridging values within the external envelope into the energy models as required to demonstrate compliance with the English building regulations for dwellings (Approved Document L, Volume 1) and for buildings other than dwellings (Approved Document L, Volume 2). The basic principles associated with determining thermal bridging values within the external envelope can be found in TN108.

### Relevant Standards

- 2 Relevant standards can be found in TN106.

### Notation

Symbol	Quantity	Unit
$A$	Area	$m^2$
$C_p$	Specific heat capacity	$J/kg \cdot K$
$H$	Heat transfer coefficient	$W/K$
$\dot{Q}$	Heat flow	$W$
$d$	Thickness or depth	$m$
$T$	Temperature	$K$
$\theta$	Temperature (Celsius)	$^{\circ}C$
$\varepsilon$	Emissivity	-
$q$	Rate of air leakage	$m^3/s \cdot m^2$
$\rho$	Density	$kg/m^3$
$p$	Pressure	$Pa$
$L$	Thermal conductance, overall	$W/K$
$\mathfrak{R}$	Thermal resistance, overall (1/L)	$K/W$
$U$	Thermal transmittance (over an area)	$W/m^2 \cdot K$
$R$	Thermal resistance (over an area) (1/U)	$m^2 \cdot K/W$
$\lambda$	Thermal conductivity	$W/m \cdot K$