

Structural performance of systemised walls – Open profiles

This Technical Note is one of a series describing the design and assessment of curtain wall framing systems and brackets. The series comprises:

- TN 84 Structural performance of systemised walls - Introduction
- TN 85 Structural performance of systemised walls - Design charts and profile data
- TN 86 Structural performance of systemised walls – Connections
- TN 87 Structural performance of systemised walls – Closed profiles
- TN 88 Structural performance of systemised walls – Buckling and torsion
- TN 89 Structural performance of systemised walls – Open profiles
- TN 90 Structural performance of systemised walls – Bracket requirements and principles
- TN 91 Structural performance of systemised walls – Bracket calculations

This Technical Note describes the structural behavior of open profiles; it should be read in conjunction with TN87 and TN88. TN 87 describes the behavior of closed profiles and this Technical Note describes how open profiles differ from closed profiles and additional requirements for their assessment and use.

Introduction

Open profiles are not the most efficient structural elements but they are used for practical reasons of ease of construction and to create profiles that mate together.

Open profiles have much lower torsional stiffness than a closed profile of similar proportions. As a result they:

- Twist more under load
- Are more prone to lateral torsional buckling

Open profiles are not generally amenable to checking by simple calculation. Assessment of structural performance is normally by testing or finite element analysis. However, an understanding of their behavior leads to better preliminary design and selection prior to verification of performance.

Design of cold-formed steel profiles is covered by BS EN 1993-1-3:2006.

Proprietary products such as studs are often accompanied by design/selection charts.

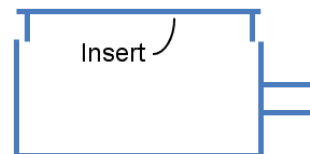
This Technical Note describes the characteristics of open profile framing members and their use as mullions, transoms, wall studs and carrier frames.

Typical open profiles (curtain walling)

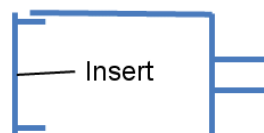
Closed profiles are the most commonly used profiles in aluminium stick curtain walling.



a) Closed profile



b) Side plate insert



c) Back plate insert