SpeediBolt®

TiltLok® Deformable Brackets

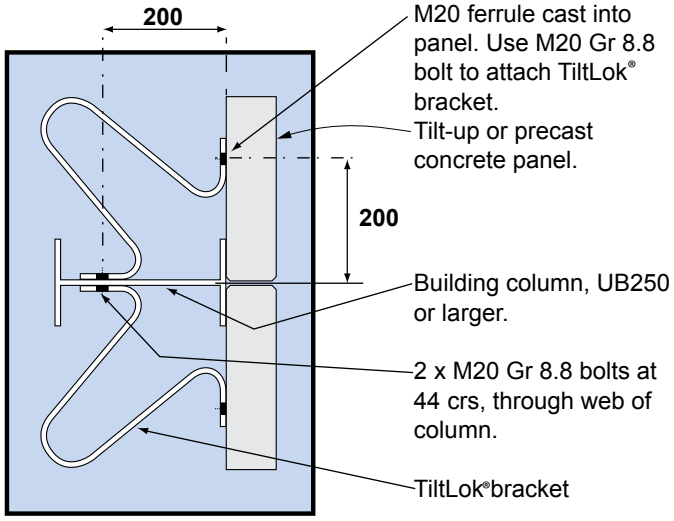
DANLEY Systems™

Commonly known as Fire Ties

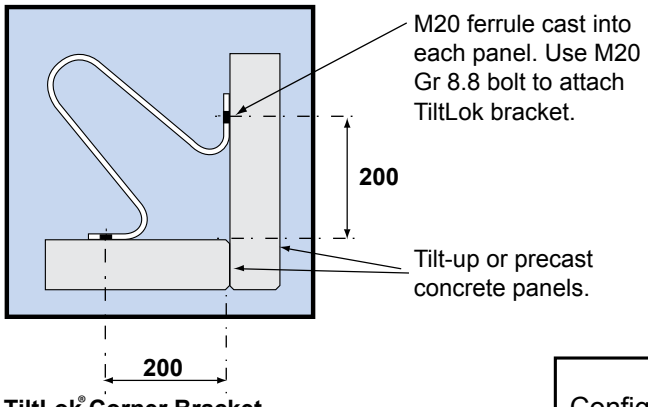
SpeediBolt® TiltLok® Deformable Brackets provide restraints for tilt-up and precast concrete panels.

These life-safety devices allow designers of buildings clad with tilt-up or precast concrete panels to specify components that meet the needs of the Building Code of Australia. The TiltLok® brackets can be used to secure panels to the structure, or to adjacent corner panels, so that in the event of a fire, the likelihood of outward collapse of the panels is minimised.

Designed and tested to meet the rigorous requirements of the Building Code of Australia.



TiltLok® Standard Brackets



TiltLok® Corner Bracket

Design requirements and limitations

- TiltLok® Deformable Brackets are required to restrain cladding panels for the duration of a fire.
- TiltLok® Deformable Brackets are designed to allow tilt-up or precast concrete panels to hog during a fire, yet prevent the panel from being displaced from a building during the fire.
- Vertical panel height should not exceed 9.0 m.
- Support column spacing should not exceed 10.0 m.
- Vertical panels must be each connected to the supporting columns, or designed such that intermediate non-attached panels are all connected, and served by TiltLok® brackets.
- TiltLok® brackets must be located less than 2.0 m from the top of the panel.
- Panels must be fitted with appropriate cast-in ferrules sized to suit loads. Brackets to be fastened to panels with M20 Grade 8.8 bolts.
- Standard brackets to be connected to column web with a pair of M20 Grade 8.8 bolts.
- The smallest column section that can be used with TiltLok® brackets is UB250.
- The Technical Note cited above suggests that for structures having columns with a bending capacity
- oMs <50 kN.m, deformable brackets need not to be used to connect panels to the columns.
- The Technical Note also suggests that the temperature of the bolts in the cast-in ferrules remains relatively low due to the concrete wall panel acting as a heat sink.
- In applications where post-installed masonry anchors are to be used with TiltLok® brackets, the capacity of the anchors should be reduced substantially to allow for elevated temperature effects.
- The use of chemical anchors is not recommended due to elevated temperature effects.

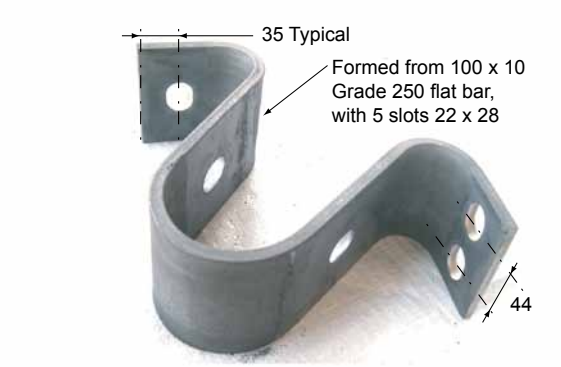
Configuration	Part No.	Finish	Unit Weight [kg]
Standard	TILT-STD [B]	Black	5.0
Standard	TILT-STD [G]	Galvanised	5.1
Corner	TILT-CNR [B]	Black	5.0
Corner	TILT-CNR [G]	Galvanised	5.1

SpeediBolt®

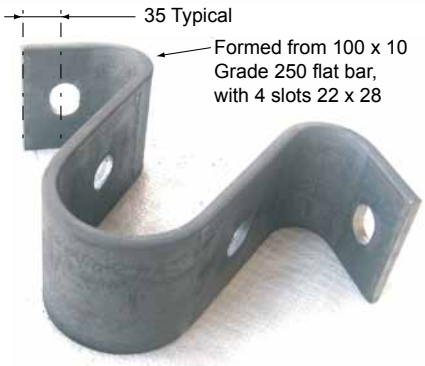
TiltLok® Deformable Brackets

Features

- Prefabricated standard components
- Made from 100 x 10 Grade 250 flat bar
- Economical, 'off-the-shelf' components
- Available in black, or galvanised
- Simple to use
- Slotted holes aid alignment
- Feature podger holes to assist in installation



TiltLok® Standard Bracket

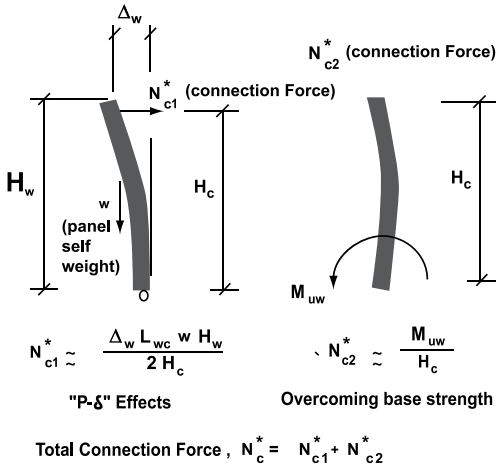


Performance Criteria

TiltLok® Deformable Brackets have been designed and tested to meet the performance criteria of Specification C1.11 of the Building Code of Australia, and the BHP Structural Steel Development Group Technical Note "*Single Storey Steel-framed Buildings - Support of External Walls in Fire*," Revised February 1997.

Testing carried out by the Structures Laboratory of the University of Queensland has shown ultimate capacity on a pair of TiltLok® brackets exceeds 164 kN, limited by Grade 8.8 fastener failure. Deformation at that load was 550 mm.

Derivation of forces



H_c the height from the base of the wall to the uppermost connection between panel and the supporting structure (m).

L_{wc} the width of wall panels laterally supported by a connection to a panel (m).

M_{uw} the ultimate moment capacity (excluding ϕ factor) at the base of a vertical panel including consideration of the base connection details but ignoring the effects of axial compression in the panel (kN-m per m), and the cracking moment.

N^*_c the design load (axial tension) required to be developed at a connection to a panel (kN).

Δ_w outwards displacement of the top of the wall (m).

w the weight of wall panel per unit area (kN/m^2).

H_w height of panel.