

SDWS — Strong-Drive® Framing Screws for Batten Tie-Downs



Timber Roof Batten Fastening with the Simpson Strong-Tie® Strong-Drive® SDWS FRAMING Screw for Residential Timber-Frame Construction (AS1684 Part2: Non-Cyclonic Areas)

The Simpson Strong-Tie Strong Drive SDWS Framing screw (Figure 1) can be used for fixing roof battens down to rafters or roof trusses to resist wind uplift. The SDWS Framing screw is a carbon steel screw with a multi-layer coating for corrosion resistance that is designed for common framing connections in light-frame timber structures. The large head resists pull-through and has a 6-lobe T25 drive recess for secure driving. Table 1 presents the model information, specification dimensions and basic mechanical properties of the fasteners.

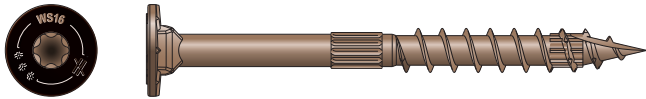


Figure 1. Simpson Strong-Tie Strong-Drive SDWS FRAMING Screw (model SDWS16300 shown).

Characteristic capacities for withdrawal and pull-through are based on data analysis per AS1649, Section 3.2 for Category A fasteners. Table 2 presents characteristic mechanical properties that are critical to batten uplift design, which depends on Type 2 connections that are designed to provide uplift resistance through the withdrawal and head pull-through. Withdrawal and pull-through design capacities are the product of the characteristic capacities (Q_k), the number of screws (n), modification factor for a fastener in side grain ($K_{13}=1.0$), and the capacity factor ($\phi = 0.85$) as described in AS1720.1-2010, Section 4.3.3.4. The capacity factor used for the design capacity is for Category 1 structural joints, which are structural joints for houses where failure is unlikely to affect greater than 25 m² or joints for secondary elements.

Table 1. Dimensional and strength specifications for the SDWS Framing screws.

| Model No. | Dimensional Specifications (mm) | | | | Specified Strengths | | | |
|-----------|---------------------------------|---------------|-----------------------|----------------|---------------------|----------------------------------|--------------|------------|
| | Length | Thread Length | Major Thread Diameter | Shank Diameter | Head Diameter | Yield Moment (N ^o mm) | Tension (kN) | Shear (kN) |
| SDWS16300 | 76 | 41 | 5.5 | 4.0 | 11.0 | 2445 | 6.1 | 3.8 |
| SDWS16312 | 89 | 51 | 5.5 | 4.0 | 11.0 | 10840 | 6.1 | 3.8 |

1. Length is top of head to point; thread length is from bottom of knurl to point.
2. The bending moment was calculated as $M_{yk} = 0.3 f_{tk} d^{2.6}$ where f_{tk} = characteristic value of tension strength and d = major diameter.
3. Tension and shear strength properties are based on 0.5 of average maximum load for screws tested in tension and shear following AISI904.

Table 2. Characteristic withdrawal and pull-through capacities (Qk) for the SDWS Framing Screw.

| Model No. | Characteristic Withdrawal (N/mm) | | Characteristic Pull-through (N) | |
|-----------|----------------------------------|-----|---------------------------------|------|
| | JD4 | JD5 | JD4 | JD5 |
| SDWS16300 | 79 | 76 | 3960 | 2800 |
| SDWS16312 | 88 | 74 | 3960 | 2800 |

1. Withdrawal resistance is based on thread length in mm embedded in the main member.
2. Characteristic withdrawal resistance calculated from test data per AS1649.
3. Characteristic pull-through resistance calculated from test data per withdrawal in AS1649.

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Table 3. JD5 - SDWS Framing screw options for roof batten tie-down in cyclonic wind zones

| Rafter or Truss Spacing (mm) | Batten Spacing (mm) | SDWS16 Framing Screw Uplift Options | | | | | | | | | | | |
|------------------------------|---------------------|-------------------------------------|-------|--------------|-------|--------------|-------|---------------------------|-------|--------------|-------|--------------|-------|
| | | Maximum internal pressure | | | | | | Partial internal pressure | | | | | |
| | | C1 | | C2 | | C3 | | C1 | | C2 | | C3 | |
| | | General Area | Edges | General Area | Edges | General Area | Edges | General Area | Edges | General Area | Edges | General Area | Edges |
| Tile Roof | | | | | | | | | | | | | |
| 450 | 330 | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| 600 | 330 | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| 900 | 330 | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| Sheet Roof | | | | | | | | | | | | | |
| 600 | 370 | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| | 450 | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| | 600 | ✓ | ✓ | ✓ | ✓ | ✓ | ✗ | ✓ | ✓ | ✓ | ✓ | ✓ | ✗ |
| | 750 | ✓ | ✓ | ✓ | ✓ | ✓ | ✗ | ✓ | ✓ | ✓ | ✓ | ✓ | ✗ |
| | 900 | ✓ | ✓ | ✓ | ✗ | ✗ | ✗ | ✓ | ✓ | ✓ | ✗ | ✓ | ✗ |
| | 1200 | ✓ | ✗ | ✗ | ✗ | ✗ | ✗ | ✓ | ✓ | ✓ | ✗ | ✗ | ✗ |
| 900 | 370 | ✓ | ✓ | ✓ | ✓ | ✓ | ✗ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| | 450 | ✓ | ✓ | ✓ | ✓ | ✓ | ✗ | ✓ | ✓ | ✓ | ✓ | ✓ | ✗ |
| | 600 | ✓ | ✓ | ✓ | ✗ | ✗ | ✗ | ✓ | ✓ | ✓ | ✗ | ✓ | ✗ |
| | 750 | ✓ | ✗ | ✗ | ✗ | ✗ | ✗ | ✓ | ✓ | ✓ | ✗ | ✗ | ✗ |
| | 900 | ✓ | ✗ | ✗ | ✗ | ✗ | ✗ | ✓ | ✗ | ✓ | ✗ | ✗ | ✗ |
| | 1200 | ✗ | ✗ | ✗ | ✗ | ✗ | ✗ | ✓ | ✗ | ✗ | ✗ | ✗ | ✗ |
| 1200 | 370 | ✓ | ✓ | ✓ | ✗ | ✗ | ✗ | ✓ | ✓ | ✓ | ✓ | ✓ | ✗ |
| | 450 | ✓ | ✓ | ✓ | ✗ | ✗ | ✗ | ✓ | ✓ | ✓ | ✗ | ✓ | ✗ |
| | 600 | ✓ | ✗ | ✗ | ✗ | ✗ | ✗ | ✓ | ✓ | ✓ | ✗ | ✗ | ✗ |
| | 750 | ✓ | ✗ | ✗ | ✗ | ✗ | ✗ | ✓ | ✗ | ✓ | ✗ | ✗ | ✗ |
| | 900 | ✗ | ✗ | ✗ | ✗ | ✗ | ✗ | ✓ | ✗ | ✗ | ✗ | ✗ | ✗ |
| | 1200 | ✗ | ✗ | ✗ | ✗ | ✗ | ✗ | ✓ | ✗ | ✗ | ✗ | ✗ | ✗ |

- Notes:**
1. Tile roof also includes concrete or terracotta tiles. Sheet roof also includes metal or other 'lightweight' tiles or other sheet material.
 2. General area also includes any roof area that is greater than 1200mm away from the edges of a roof. Edges include edges, hips, ridges, fascias and barges.
 3. Roofing manufacturer may require batten spacings to be reduced at or near edges to reduce uplift forces and therefore permit use of lower strength connections.
 4. Uplift data used from Table 9.14 of AS1684.3
 5. Where ceiling or eaves lining is placed on top of rafter or trusses, or where the ceiling or eaves lining does not have sufficient strength to resist internal pressures, or where roof cavities are vented to internal room, e.g., manhole covers not rigidly fixed, then the batten to rafter/truss shall be designed for maximum internal pressure. Where ceiling-lining material is structurally sufficient to resist the maximum internal pressure and the ceiling cavity is not vented to internal room pressure, then the batten to rafter/truss connection may be designed for partial internal pressure.
 6. Maximum batten thickness 35mm.

SDWS16300 or longer
 Not suitable

Table 4. JD5 – SDWS Framing screw options for roof batten tie-down in non-cyclonic wind zones.

| Rafter or Truss Spacing mm | Batten Spacing mm | Wind Classification | | | | | | | |
|----------------------------|-------------------|---------------------|-------|--------------|-------|--------------|-------|--------------|-------|
| | | N1 | | N2 | | N3 | | N4 | |
| | | General Area | Edges | General Area | Edges | General Area | Edges | General Area | Edges |
| Tile Roof | | | | | | | | | |
| 450 | 330 | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| 600 | 330 | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| 900 | 330 | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| 1200 | 330 | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| Sheet Roof | | | | | | | | | |
| 600 | 370 | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| | 450 | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| | 600 | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| | 750 | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| | 900 | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| | 1200 | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✗ |
| 900 | 370 | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| | 450 | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| | 600 | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| | 750 | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✗ |
| | 900 | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✗ |
| | 1200 | ✓ | ✓ | ✓ | ✓ | ✓ | ✗ | ✗ | ✗ |
| 1200 | 370 | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| | 450 | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| | 600 | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✗ |
| | 750 | ✓ | ✓ | ✓ | ✓ | ✓ | ✗ | ✓ | ✗ |
| | 900 | ✓ | ✓ | ✓ | ✓ | ✓ | ✗ | ✗ | ✗ |
| | 1200 | ✓ | ✓ | ✓ | ✗ | ✓ | ✗ | ✗ | ✗ |

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1. Tile roof also includes concrete or terracotta tiles. Sheet roof also includes metal or other 'lightweight' tiles or other sheet material.
 2. General area also includes any roof area that is greater than 1200mm away from the edges of a roof. Edges include edges, hips, ridges, fascias and barges.
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 4. Uplift data used from Table 9.14 of AS1684.3
 5. Maximum batten thickness 35mm.

SDWS16300 or longer
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