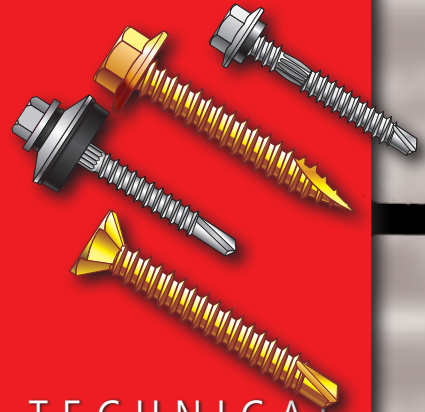


# POWERS SCREW SOLUTIONS



TECHNICAL  
SPECIFICATION  
GUIDE



### CLASS 4 SCREWS THAT WITHSTAND THE TEST OF TIME

POWERS FASTENERS continue to expand its range of screws in line with market changes and demand. We also continue to innovate and listen to our customers to ensure we remain a market leader. All POWERS FASTENERS screws comply with Australian Standards and are rigorously tested to ensure these standards are maintained from batch to batch. The POWERS Alzin4 coating complies with Class 4 under both the real-world testing standard and the Table 2 standard under AS3566.2-2002, meaning this sacrificial layer will withstand the harshest Australian environments given it is a minimum thickness of 45microns with a porosity value of no less than 8. Can you ensure other brands comply and can guarantee they will stand the test of time? **Look for the P+ or 4XP head mark for peace of mind!**

### POWERS PROVING GROUND - 16 metres above sea level - 150 metres to breaking surf

#### CLASS 4 CORROSION COATING FROM POWERS

POWERS have worked with one of the industry leaders in developing a premium corrosion-resistant coating known as Alzin4. This mechanical plating method is widely recognised for not inducing hydrogen embrittlement and enabling higher coatings of 25 microns or more to be applied to the fastener.

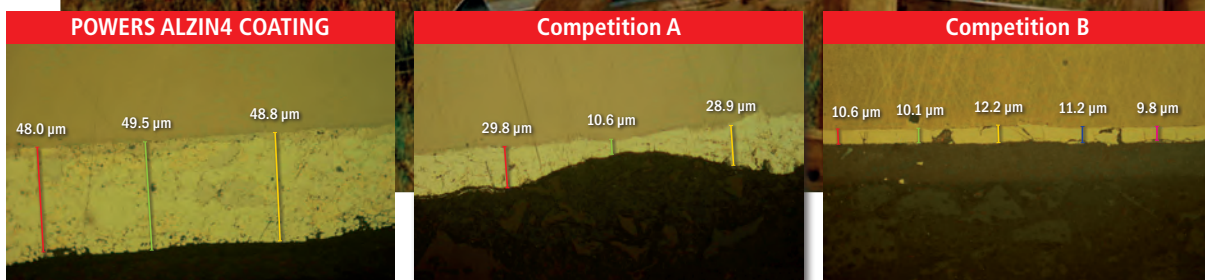
POWERS revolutionary Alzin4 product has been designed to suit the harsh Australian conditions and to meet the requirements of Australian Standard AS3566.2-2002. This method of applying coatings provides a more aesthetic and uniform finish with a high density rating.

Alzin4 is POWERS answer to severe marine and industrial environments and is therefore applied to all of our Hex Head range that are intended for installation into steel and timber battens or steel purlins.

Engineered to combat the extreme effects of salt, wind and moisture, POWERS Alzin4 provides high-quality corrosion resistance in tropical regions, extreme marine and industrial environments, areas where chemical or agricultural spraying may be undertaken or in any situation requiring high-performance, premium quality corrosion-resistant fasteners.








#### COMPETITOR COATING ANALYSIS (x500 magnification)





## Selection Guide

Exposure Severity	Distance from marine influences and others (approx) see item 5	Suggested Fastener	Life in Years (approx)
 Very Severe Marine	0 - 100 meters	304 or 316 Stainless Steel	15
 Severe Marine	100 - 400 meters	Class 4	12
 Marine	400 - 1000 meters	Class 4	20
 Moderate	1000 meters +	Class 3 / 4	20 / 30
 Benign	2000 meters +	Class 3 / 4	40 / 60

In a benign or moderate environment a Class 3 coated screw is suitable but this will depend on many contributing factors that might need to be considered in the surrounding area. **To prevent an inappropriate coated fastener accidentally being selected, Powers Fasteners only market the Class 4 coated product in all the Hex Headed range of screws that are used in external environments.**

## Guidelines for Selection of Fasteners based on Galvanic Action

Fastener Metal Base Metal	Zinc & Galvanised Steel	Aluminium & Aluminium Alloys	Steel & Cast Iron	Brasses, Copper, Bronzes, Monel	Martensitic Stainless Type 410	Austenitic Stainless Types 302 / 304 / 303 / 305
Zinc & Galvanised Steel	A	B	B	C	C	C
Aluminium & Aluminium Alloys	A	A	B	C	NOT Recommended	B
Steel & Cast Iron	A D	A	A	C	C	B
Terne (Lead-Tin) Plated Steel Sheets	A D E	A E	A E	C	C	B
Brasses, Copper, Bronzes, Monel	A D E	A E	A E	A	A	B
Ferritic Stainless Type 430	A D E	A E	A E	A	A	A
Austenitic Stainless Types 302 / 304	A D E	A E	A E	A E	A	A

**KEY:**

- A** Corrosion of the base metal is NOT increased by the fastener
- B** Corrosion of the base metal is MARGINALLY increased by the fastener
- C** Corrosion of the base metal MAY be markedly increased by the fastener
- D** The plating of the fastener is RAPIDLY consumed, leaving the bare fastener metal
- E** Corrosion of the fastener is INCREASED by the base metal

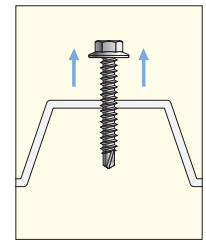
NOTE: Surface treatment and environment can change activity



**INDEPENDENT TEST RESULTS IN ACCORDANCE WITH AS3566.1-2002**

**Test Material G450-Z350 Purlin - 1.5mm thick**

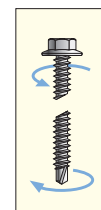
Self-Drilling Screws for Steel				
HRL(NATA) Report No	Gauge	TPI	Ultimate Average Pullout Load	Ultimate Torsional Strength
48121258B	10	16	3.7 kN	9.3 Nm
48121258E	10	24	4.1 kN	9.7 Nm
48121258C	12	14	3.6 kN	13.9 Nm
48121258F	12	24	4.2 kN	14.0 Nm
48121258A	14	10	3.7 kN	21.3 Nm
48121258D	14	14	4.0 kN	21.9 Nm
48121258G	14	20	4.4 kN	22.7 Nm



**Pullout Load (kN)**  
Tensile Load needed to pull screw out of substrate

**Test Material F5 Radiata Pine - 25mm embedment**

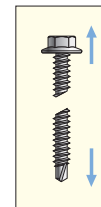
T17 Self-Drilling Screws for Timber				
HRL(NATA) Report No	Gauge	TPI	Ultimate Average Pullout Load	Ultimate Torsional Strength
48121258H	10	12	4.5 kN	7.8 Nm



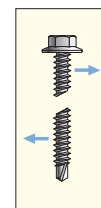
**Torsional Strength (Nm)**  
Torque required to break the screw

**Test Material F5 Radiata Pine - 30mm embedment** (30mm embedment for #12 and 35mm embedment for #14)

T17 Self-Drilling Screws for Timber				
HRL(NATA) Report No	Gauge	TPI	Ultimate Average Pullout Load	Ultimate Torsional Strength
48121258I	12	11	4.8 kN	12.5 Nm
48121258J	14	10	6.6 kN	16.9 Nm



**Axial Tensile Strength (kN)**  
Tensile Load required to break the screw



**Single Shear Strength (N)**  
Shear Load required to break the screw

- Pullout Load and Torsional Strength tests performed in accordance with AS 3566.1 - 2002 - Self-drilling screws for the building and construction industries
- All of the tests above were performed in an independent NATA approved laboratory
- These results only apply to POWERS FASTENERS self-drilling screws - P+ and 4XP head marked
- All data is printed with permission from HRL Material, part of the HRL Limited Group of Companies

COMPLETE INDEPENDENT TEST REPORTS ARE AVAILABLE UPON REQUEST. PHONE (03) 8795 4600

**INDEPENDENT TEST RESULTS**

**Test Material F5 Radiata Pine - 30mm embedment      Test Material G450 - Z350 Purlin - 1.5mm thick**

POWERS Zip-It Self-Drilling Screws for Steel and Timber					
HRL(NATA) Report No	Gauge	TPI	Ultimate Average Pullout Load F5 Pine	Ultimate Average Pullout Load G450-Z350	Ultimate Torsional Strength
48121258M*	14	13	5.8 kN	5.0 kN	15.0 Nm
48121258K*	M5	11	5.1 kN	4.8 kN	13.2 Nm
48121258L*	M6	13	6.3 kN	4.2 kN	15.3 Nm

\* The above screws are not covered in AS3566.1-2002 However procedures outlined in this standard were used for tests.

AN APPROPRIATE SAFETY FACTOR MUST BE APPLIED TO ALL TABULATED RESULTS TO DETERMINE A SAFE WORKING LOAD

## TEST RESULTS - POWERS LABORATORY ULTIMATE AVERAGE LOAD VALUES

### Test Material Purlin

#### Self-Drilling Screws for Steel in Various Steel Thicknesses

Size	1.0mm G550	1.2mm G550	1.5mm G450	1.9mm G450	2.4mm G450	3.0mm G450	4.0mm G350	5.0mm G350	6.0mm G350
6 - 20	1.8 kN	2.3 kN	3.0 kN	3.7 kN	5.5 kN				
8 - 18	2.3 kN	2.6 kN	3.1 kN	4.1 kN	6.5 kN				
10 - 16	2.1 kN	2.6 kN	3.7 kN	4.3 kN	6.2 kN	8.2 kN			
10 - 24	2.2 kN	2.8 kN	4.1 kN	5.3 kN	7.4 kN	10.2 kN	10.9 kN		
12 - 14	2.3 kN	2.3 kN	3.6 kN	4.5 kN	6.3 kN	8.2 kN	14.2 kN		
12 - 24	2.1 kN	2.4 kN	4.2 kN	5.2 kN	7.3 kN	8.2 kN	16.4 kN	16.4 kN	16.4 kN
14 - 10	1.9 kN	2.5 kN	3.7 kN	5.1 kN	7.3 kN	9.4 kN	19.2 kN	19.5 kN	
14 - 14	1.9 kN	2.4 kN	4.0 kN	5.1 kN	7.3 kN	13.6 kN	17.2 kN	20.2 kN	
14 - 20	2.7 kN	3.1 kN	4.4 kN	6.1 kN	8.5 kN	12.8 kN	20.0 kN	20.3 kN	21.0 kN

### Test Material F5 Radiata Pine - At Various Depths of Embedment

#### T17 Self-Drilling Screws for Timber

Size	20mm	25mm	30mm	35mm	50mm
6 - 18	2.4				
8 - 15	2.6				
10 - 12	3.6	4.5	4.6	4.7	6.6
12 - 11		4.1	4.8	5.3	
14 - 10			6.6	6.8	7.1



## SCREW MECHANICAL PROPERTIES

#### Self-Drilling Screws for Steel

Gauge	TPI	Axial Tensile Strength	Single Shear Strength
10	16	10.9 kN	9.2 kN
10	24	10.9 kN	9.2 kN
12	14	16.4 kN	11.2 kN
12	24	16.4 kN	11.2 kN
14	10	21.0 kN	14.1 kN
14	14	21.0 kN	14.1 kN
14	20	21.0 kN	14.1 kN

#### T17 Self-Drilling Screws for Timber

Gauge	TPI	Axial Tensile Strength	Single Shear Strength
10	12	11.1 kN	10.1 kN
12	11	16.7 kN	11.5 kN
14	10	21.8 kN	16.1 kN

#### POWERS ZIP-IT Self-Drilling Screws for Steel and Timber

Gauge	TPI	Axial Tensile Strength	Single Shear Strength
14	13	21.9 kN	16.2 kN
M5	11	16.5 kN	11.3 kN
M6	13	21.4 kN	15.2 kN

- These results apply to POWERS self-drilling screws - P+, 4Xp and PF head-marked screws
- All tests were conducted in a controlled laboratory using NATA calibrated equipment

AN APPROPRIATE SAFETY FACTOR MUST BE APPLIED TO ALL TABULATED RESULTS TO DETERMINE A SAFE WORKING LOAD



### Recommended drill speeds

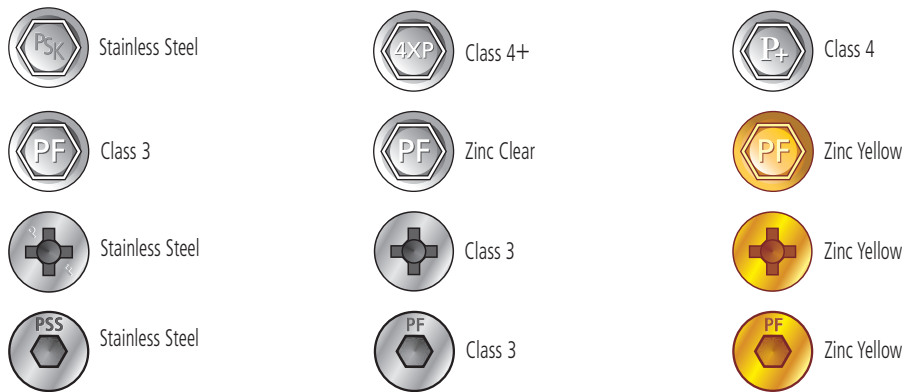
Screw Type	RPM
Metal SDS	2500
Timber - Type 17	1500
Chipboard	1000
Needle Point	2500
Metal No.5 points	1800

Note: Appropriate screw gun/drill with torque control and depth gauge adjustment should be used.

**IMPORTANT NOTES .**

1. A Class 3 coated product should not be used within 400 metres of the ocean or where there are severe marine influences.
2. Stainless Steel fasteners are recommended for Stainless Steel and Aluminium Roofing.
3. Industrial buildings or sheds that are used for animal farming or are involved with chemicals or acids can be severe, including dwellings that are near by, consult advice if required.
4. This information has been supplied as a guide only and has not been prepared for any one person, application or location. You should always seek professional advice if unsure.
5. Australia has a wide variety of climatic conditions that include tropical, alpine regions, coastlines with heavy surf and the deserts of the Australian interior. In addition to these we also have to consider the effects of man made environmental issues, distance from water, smell of salt, prevailing winds, elevations, humidity and unwashed areas are all just a few factors that need to be considered. It is with this in mind that Powers Fasteners only supply the Class 4 coating on all Hex Head self-drilling screws for external applications.
6. Please check with your Roofing and Wall sheeting supplier for their recommendations for the type of material that is suggested for use in these areas and minimum maintenance periods. Other types of materials can be suggested for use, therefore different fasteners may be required for the installation. You should always seek professional advice if unsure.

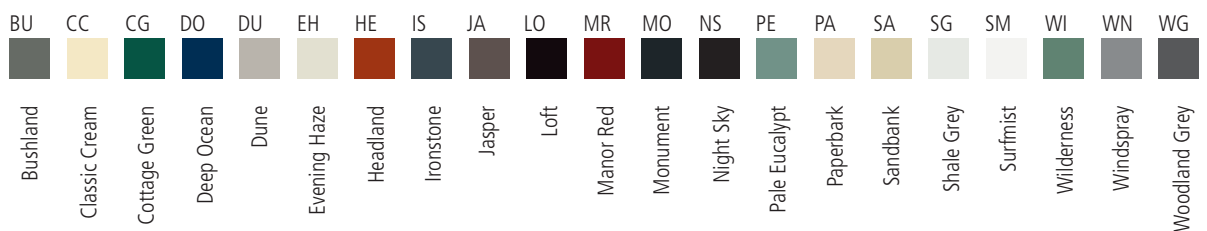
### POWERS Screws - Head Styles



### POWERS PAINTED SCREW SOLUTIONS

POWERS has continued to grow its range of high-quality screws and are now positioned to offer a complete range of head-painted screws to match most common COLORBOND® steel colours in a range of popular sizes.

Standard Stocked Colours



## COMPLIANCE AND QUALITY CONTROL

Where applicable, all POWERS self-drilling screws are manufactured and tested in accordance with the **Australian Standard AS3566 .1- 2002**. Testing occurs at all stages of the manufacturing process including the manufacturing plant and within the POWERS laboratory. POWERS has a strict regime of pre-shipment and post-shipment testing which includes the following:

- Dimensions
- Bend ductility to 12 degrees
- Torsional strength
- Drill and drive
- Manual installation
- Coating
- Colour matching
- Washer conductivity
- Hardness
- Tension load pullout
- Shear loads

Hardness and Coating Testing Station



Drill and Drive Testing



Instron Load Testing



500x Magnification - Hardness Testing



Application Testing



Colour Matching



Coating Thickness Testing



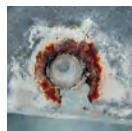
Torsional Strength Testing



Washer Conductivity



POWERS only uses DEKS sealing washers due to their non-conductive nature and life expectancy. All DEKS washers are covered by a 20 year warranty.



Example of corrosion caused by inferior conductive washers



Look for the **embedded** blue stripe for guaranteed performance

## POWERS SELF-DRILLING SCREWS PRODUCT WARRANTY

Powers Fasteners Australasia Pty Ltd offers quality and performance with its range of self drilling screws. ALZIN® Class 4 coating is standard on all Powers P+ and 4XP head marked hex head carbon steel self drilling screws, which represents a high quality corrosion resistant protective coating for tropical, marine and industrial environments. Powers also offer carbon steel self drilling screws with an optional Class 3 corrosion resistant coating which if used in the correct environment will provide exceptional corrosion protection. The Powers PSK range consists of Austenitic 302, 304 and 305 stainless steel self drilling screws and are designed for the most severe of environments. In having full confidence in its products, Powers warrant all Powers self-drilling screws with corrosion resistant coatings consisting of ALZIN® Class 4 and Class 3 as well as stainless steel PSK screws in accordance with the Powers corrosion resistant fastener selection guide table.

Powers does not envisage any problems occurring within the warranty period that might relate to defective screws. In the unlikely event that this may occur Powers Fasteners undertakes to replace any such defective screws at no cost, under the following terms and conditions:

1. This certification does not apply to product failure due to improper design or screw selection, improper installation practice not in accordance with published installation instructions, or when the environment or chosen location of the installation would be degrading to the fastener.
2. This warranty shall not be applicable if any of the following shall occur,
  - A The system is damaged by natural disasters
  - B The system is damaged by any acts of negligence, accidents or misuse, including but not limited to vandalism, civil disobedience or acts of war.
3. This warranty shall be null and void if, after installation of the fasteners there are any alterations or repairs made or objects such as but not limited to structures, fixtures, or utilities being placed upon or attached, that would damage the integrity of the installation.
4. This warranty states that Powers Fasteners liability herein shall be limited to the replacement of any defective screws only, any such replacement and installation will be carried out by a Powers Fasteners approved agent and or installer.
5. In no event shall Powers Fasteners be liable for incidental, consequential, punitive, or personal liability or other damage, including but not limited to, loss of profits or damage to the building or content.
- 6 THERE ARE NO COVERAGES WHICH EXTEND BEYOND THE FACE HEREOF.
- 7 NO REPRESENTATIVES OF POWERS FASTENERS HAS THE AUTHORITY TO MAKE ANY REPRESENTATIONS OR PROMISES EXCEPT AS STATED HEREIN .

THIS WARRANTY IS ISSUED BY POWERS FASTENERS PTY LTD, A.C.N 062 405 378

Effective 1st January 2011



**VIC** T: 03-8795 4600 F: 03-8787 5899

**NSW** T: 02-4634 7600 F: 02-4648 3139

**QLD** T: 07-3441 9300 F: 07-3441 9399

**WA** T: 08-9408 9600 F: 08-9303 4477

**SA** T: 08-8161 3000 F: 08-8443 6565

**NT** T: 08-89475097 F: 08-8947 5124

**FNQ** T: 0439 083 646 F: 07-4036 1374

**NZ** T: +64-9415 2425 F: +64-9415 2627

