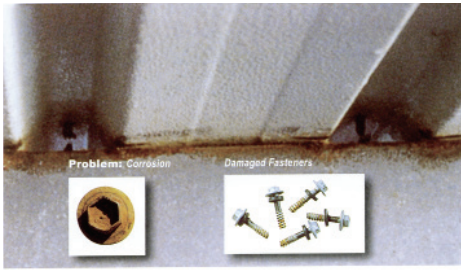


**CORROSION MANAGEMENT**

**Climaseal®**



Corrosion of fasteners can be caused by salt laden air from the ocean, airborne acids from industry and chemical sprays, U.V. from the sun or humidity in tropical and moist areas. Corrosion dramatically affects the performance of fasteners over their lifetime, subsequently effecting the long term structural integrity of any constitution.

Protective coatings placed on fasteners provide various levels of protection. The Australian Standard for fastener performance (AS3566), which Buildex played a major role in the development, currently lists four classes for corrosion coatings.

Class 1 - for general internal use, most drywall and chipboard screws are in this category.

Class 2 - for general internal use where significant levels of condensation occurs. Electroplated Zinc is generally used to meet this class.

Class 3 - For general external use in mild and moderate industrial and mild marine applications. In moderate marine applications Buildex strongly recommends Climaseal 4.

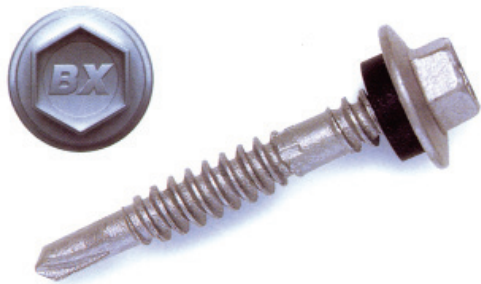
The class is intended for roofing and cladding screws in standard applications.

Fastener compliance used to be achieved by accelerated laboratory testing. The new revision recommends the use of 'real world' testing - exposure on an outdoor test site with a maximum observable rust presence of 5%. In the case of heavy zinc coatings, 40µm is deemed to comply. Alloy plating of ZINC/TIN 25µm is equivalent to heavy zinc at 40µm. Buildex coating Climaseal 3 complies with this class.

Class 4 - For external use in moderate and severe marine environments, classified in accordance with ISO 9223 as generally between 100m from the beach front to approximately 300m inland. In high winds this may extend further inland.

Compliance is to be assessed through real world testing "when testing at an approved outdoor test site there shall be no red rust present on the significant surfaces of 95% of the fasteners tested". These outdoor test sites must be located less than 500m from the mean high water line, in a coastal area with surf for most of the year.

Buildex coating ZACS 4 and Climaseal 4 comply with this class.



**The Buildex® Solution**

**PROTECTION WITH Climaseal 3®**

**Climaseal 3® is an unique anti-corrosive coating system consisting of 3 distinct layers which combine to give exceptional corrosion protection:**

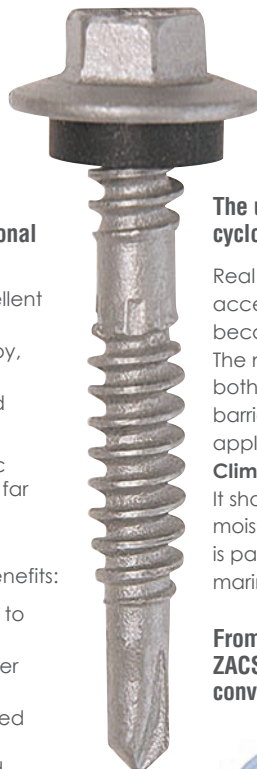
- (1) A mechanically deposited zinc alloy coating giving excellent galvanic protection.
- (2) A chromate conversion coating to passivate the zinc alloy, further inhibiting coating loss.
- (3) An aluminium filled polyester coating with good all-round corrosion and long-term weathering resistance.

Designed to conform to AS3566 Class 3, real life atmospheric testing has confirmed that the performance of Climaseal 3® far exceeds the standard!

If you want a fastener with a high-performance, corrosion resistant coating that won't let you down, consider these benefits:

- Minimal risk of coating damage during installation thanks to new, tougher coating formula.
- Better driving performance because of a smoother, harder finish.
- Superior performance in extreme temperatures, developed and tested in Australia for Australasian conditions.
- Effective sealing of roofing sheets/cladding and reduced corrosion with an improved black non-conductive EPDM seal. The black seal remains elastic in temperature extremes, and will not breakdown and allow water entry.

Climaseal 3® should be used for general external use in mild and moderate industrial, and mild marine applications



**THE ULTIMATE BARRIER Climaseal® 4 C4**

**The ultimate anti-corrosion coating for roof fasteners and cyclone plates.**

Real world testing has exposed many deficiencies with the acceptance of coated finishes as "deem to comply", simply because of thickness and density measurements.

The new **Climaseal®4** coating is a layered system, combining both a high density sacrificial coating substrate, over which a barrier top coat has been applied. The Climaseal®4 is then applied by a new, environmentally friendly, processing system.

**Climaseal®4 meets and exceeds AS3566 Class 4 specifications.** It should be used in coastal areas where salt, wind, UV and moisture are prevalent, in tropical zones and industrial areas. It is particularly recommended for use in moderate and severe marine environments.

**From 2004 onwards, a number of Buildex Climaseal®3 and all ZACS®4 coated fasteners, will have their coating finish converted to Climaseal®4.**

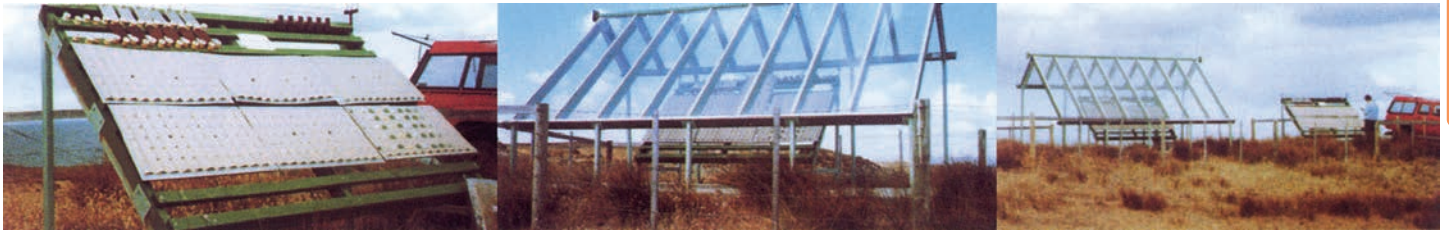


**All Climaseal®4 coated screws are easily recognisable by their silver/blue appearance, the "BXZ4" marking on the screw head, and the blue stripe found on the label packaging of Buildex bulk boxes and trade packs.**

**DEVELOPMENT & TESTING PROGRAM**

**World's only manufacturer that achieved AS3566 Standard with Real World Testing.**

More than 15 years of ongoing Real World Testing with leading steel manufacturer BlueScope Steel and leading research organisation, Commonwealth Scientific and Industrial Research Organisation (CSIRO).



• Open rack - simulates conditions on a roof

• Sheltered rack - simulates under roof and non-rain washed situation

Buildex operates and supports a research, development and testing program aimed at ensuring the customer and the building owner get the best value for money from the fasteners they purchase.

**Real World Test Sites**

In order to test the actual corrosion performance of our products, Buildex has three test sites and use a further four sites (operated by ITW Buildex & CSIRO). These test sites are positioned at known corrosively aggressive locations around Australia.

Unlike accelerated laboratory testing, these sites expose the products to the combinations of corrosive influences that exist in the real world e.g. Chlorides (Marine) Humidity (Condensation) Acid Rain (Industrial) Ultra Violet (UV)

**Scientific Monitoring**

All the sites are scientifically monitored to determine the degree of corrosivity at each site. This is done independently by the CSIRO.

**Results of Buildex Testing**

Buildex has over 15 years experience with real world testing. Many of our products have been developed and improved as a direct result from what has been learned during the testing. The severe conditions at these sites will give an indication of the product performance after approximately one year. The test also cover competitors' products.

**THE BUILDLEX WARRANTY**

Buildex fasteners are made to exacting high standards of quality, subjected to strict inspection and testing procedures.

Buildex is so confident that it can guarantee the highest quality and performance of its fasteners that it has backed it up with the Buildex Warranty, an industry first.

The Buildex Warranty applies to Climaseal 3, Climaseal 4 & ZACS 4 coated roofing screws with ShankGuard and fully threaded roofing and cladding screws. It guarantees against the loss of structural integrity due to the effects of corrosion or metallurgical defects.

ENVIRONMENTAL CHARACTERISTICS (To determine the type of environment, see inspection of buildings in the area to which fasteners will be used)	WARRANTY PERIODS	
	Climaseal 3 (AS 3566 Class 3)	Climaseal 4 / ZACS 4 (AS 3566 Class 4)
VERY SEVERE MARINE (ISO Category 5) Sea level or above. High salt concentrations and high humidity.	Not recommended	Not recommended
SEVERE MARINE (ISO Category 4) Sea level or above. High salt concentrations and high humidity.	Not recommended	12 years
MILD TO MODERATE MARINE (ISO Category 3) Sea level or above. Moderate salt concentrations and high humidity.	7 years	20 years
VERY SEVERE INDUSTRIAL (ISO Category 5) Sea level or above. High concentrations of industrial pollutants and high humidity.	Not recommended	Not recommended
SEVERE INDUSTRIAL (ISO Category 4) Sea level or above. High concentrations of industrial pollutants and high humidity.	Not recommended	20 years
INDUSTRIAL (ISO Category 3) Sea level or above. Moderate concentrations of industrial pollutants and high humidity.	20 years	30 years
LIGHT INDUSTRIAL/URBAN (ISO Category 2-2a) Sea level or above. Low concentrations of industrial pollutants and high humidity.	20 years	50 years
MILD URBAN/RURAL (ISO Category 1-2) Sea level or above. Low concentrations of industrial pollutants and high humidity.	40 years	60 years

**Buildex Corporate Profile**

ITW Buildex is Australia's leading manufacturer and supplier of self-drilling screws and fasteners.

Established in 1917, the head office is in Moorabbin, Victoria. The on-site manufacturing plant produces hundreds of millions of painting and stainless steel fasteners are made inspection and test procedures.

ITW Buildex is quality endorsed to ISO 9001:2008 and is committed to developing modern, innovative products utilising the latest technology available worldwide.

**SYSTEMS OPTIONS**

**Self-Drilling Screws**

**Screw Size Identification**

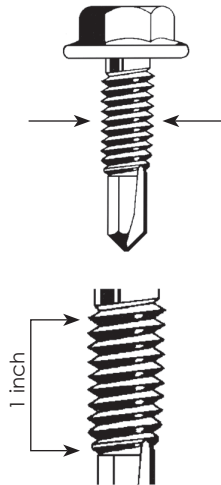
For all screw descriptions in the Buildex range, the first figure indicates the gauge of the screw (G), the second figure indicates the threads per inch (TPI) and the third figure indicates the length of the screw (mm).

eg. 14-10 x 20mm= 14 gauge, 10 threads per inch, 20mm length.

**Gauge (G)**

The gauge of the screw is determined by the basic size of the thread outside diameter Standard gauges for Buildex screws:

6 gauge	=	3.5mm
8 gauge	=	4.2mm
10 gauge	=	4.8mm
M6 gauge	=	6.0mm
12 gauge	=	5.5mm
13 gauge	=	6.1mm
14 gauge	=	6.3mm
15 gauge	=	6.5mm

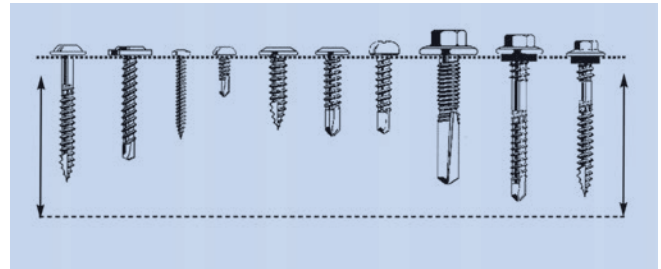


**TPI (Threads Per Inch)**

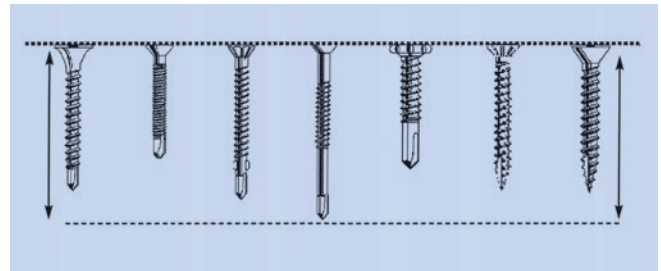
The TPI is the number of thread crests that can be counted along a lineal measurement of 1 inch (25.4mm).

**Length of Fasteners**

The following types of fasteners are measured from the underside of the head to the point of the screw:



The following types of fasteners are measured from the top of the head to the point of the screw.



**Fixing to Metal**

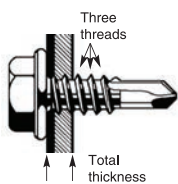
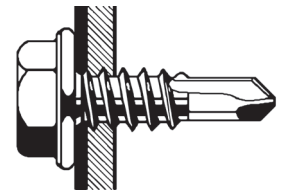
**Buildex® Metal Tek®** self-drilling screws have a hardened drill point that will drill and thread in structural steel and mild steel. These Tek points are designed in a manner much the same as a HSS high speed steel drill bits. There are two main criteria of a Tek® point:

- (1) The point must be in perfect diameter ratio relationship to the thread, so as to not overdrill. This allows the thread to engage in the steel at an acceptable tapping torque. The pullout load is also determined by the ratio of the thread diameter to the hole diameter.
- (2) The point must have a swarf flute longer than the total thickness of the steel being drilled. This prevents problems with fastener installation due to swarf clogging the flute.

It is important that the drill point has completed drilling the total thickness of the steel before the thread engages.

The drilling advance speed (ie. speed the drill point travels into steel), is about ten times slower than the thread advance speed. For instance a 10 gauge X 16mm Tek drills 3mm steel in about 7 seconds. The thread on the fastener only takes less than one second to travel through the 3mm steel.

To choose the correct fastener, it is necessary to select one where the length of the drill point is equal to or greater than the total thickness of the material to be drilled including the air-gap. If the drill point is less than the total thickness of the material and the thread engages, then the fastener can break or become impossible to drive.



As a rule the correct length screw should have at least 3 threads protruding behind the metal you are fastening to

The table indicates the metal thickness capacity of each gauge size available. When the gauge size has been determined, the length and head style for the intended application would then need to be determined.

Screw Gauge	Threads per inch	Drilling Capacity (range in mm)
6	20	0.75-2.5
8	18	0.75-2.5
10	16	0.75-3.5
10	24	1.2-5.0
12	14	1.0-5.0
12	24	1.2-5.0
14	10	1.0-5.0
14	20	1.2-6.0
15	15	0.5-2.4
Series 500-12g	24	3.0-12.0

## SELECTION GUIDE

### Crest Fixing



Without Insulation  
With Insulation

**Drilling Capacity < 5.0mm**  
CTEKS 12-14 x 50 HGS  
CTEKS 12-14 x 68 HGS

**Drilling Capacity < 12.0mm**  
CTEK5 12-24 x 53 HWFS  
CTEK5 12-24 x 68 HWFS

### Valley Fixing

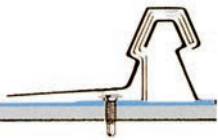


Without Insulation  
With Insulation

**Drilling Capacity < 5.0mm**  
CTEKS 10-14 x 20 HWFS  
CTEKS 12-14 x 30 HWFS

**Drilling Capacity < 12.0mm**  
CTEK5 12-24 x 38 HWFS  
CTEK5 12-24 x 38 HWFS

### Clip Fixing



Without Insulation  
With Insulation

**Drilling Capacity < 5.0mm**  
MTEKS 10-24 x 16 WAF  
MTEKS 10-24 x 22 WAF

**Drilling Capacity < 12.0mm**  
CTEK5 12-24 x 38 WAF

### Side Fixing (Stitching)



**Drilling Capacity < 2.4mm**  
CMBT 15-15 x 20 HWFS

## Technical Specifications

### Ultimate Average Pullout Loads Buildex TEKS® Screws Pullout data into G450 Steel (kN)



Teks	1.0mm G450	1.2mm G450	1.5mm G450	1.9mm G450	2.4mm G450	3.2mm G450
10-16	2.8	3.5	4.3	5.8	8.3	9.5
10-24	2.4	2.8	3.5	3.1	7.0	10.4
12-14	2.8	3.1	4.2	5.5	7.3	9.4
12-24	2.4	2.9	3.9	5.4	7.3	10.4
14-20	2.6	3.2	4.2	5.5	7.7	11.0

### Pullout data into G250/G300 Steel (kN)

Teks	1.0mm G250	1.2mm G300	1.5mm G250	1.9mm G300	2.4mm G250	3.2mm G250
10-16	1.8	2.5	3.4	4.9	7.0	8.4
10-24	1.5	2.2	3.3	2.8	8.4	8.1
12-14	1.7	2.4	3.4	3.0	6.9	8.9
12-24	1.5	2.1	3.0	2.8	6.3	8.2
14-20	1.4	2.1	3.6	3.0	6.8	9.2

### Pullout data into S275 Steel (kN)

Teks	3mm S275
12-14	8.2

### Mechanical Properties Shear (kN), Tensile (kN) and Torsional Strengths (Nm)

Teks	Single Shear	Axial Tensile	Torsional
10-16	6.8	11.9	8.4
10-24	6.2	11.4	8.6
12-14	8.8	15.3	13.2
12-24	9.0	16.7	13.5
14-20	11.2	21.2	20.4
15-15	6.4	15.3	12.6

Note: All values are ultimate averages obtained under laboratory conditions (N.A.T.A approved)  
Appropriate safety factors should be applied for design purposes. These figures apply to Buildex® (BX Head marked) products only.