



Ergon Energy Corporation Limited

Technical Specification for Metric Hexagonal Bolts, Nuts, Coach Screw, and Flat Washers

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Technical Specification for Hexagonal Bolts, Nuts, Coach Screws and Flat Washers



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1. Purpose and Scope

This technical specification sets out the requirements for the manufacture, testing at works, supply and delivery of **metric hexagonal bolts, nuts, coach screws and flat washers (round and square)** for use on overhead electricity distribution systems in a totally exposed environment.

2. References

2.1 Applicable Standards

All items shall be designed, manufactured and tested with the relevant parts of the following Standards and all amendments issued from time to time except where varied by this specification.

STANDARD	TITLE
AS 1111	ISO metric hexagon commercial bolts and screws
AS 1112	ISO metric hexagon nuts, including thin nuts, slotted nuts and castle nuts
AS 1214	Hot-dip galvanized coatings on threaded fasteners
AS 1275	Metric screw threads for fasteners
AS 1393	Coach screws - Metric series with ISO hexagon heads
AS 4680	Hot-dipped galvanised (zinc) coatings on fabricated ferrous articles
AS 3679	Structural steel – Hot rolled bars & sections
AS 4291	Mechanical properties of fasteners
ISO 9002	Quality Systems - Model for Quality Assurance in Production, Installation and Servicing

3. Drawings

The following drawings shall be read in conjunction with, and shall form part of this technical specification.

REFERENCE	REVISION	TITLE
01-04-01	A	Washers, Square
01-04-02	A	Washers, Round (Large Series)

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4. Service Conditions

The items will be exposed to the following environmental conditions:

Temperatures	45°C summer day time -5°C winter night time
Solar Radiation Level	1 000 Wm ⁻² with high ultraviolet content
Precipitation	Tropical summer storms with gust winds above 160 km/h, and an annual rainfall in excess of 1500mm
Humidity	Extended periods of relative humidity in excess of 90%.
Pollution	Areas of coastal salt spray and/or industrial pollution with equivalent salt deposit densities in the range 2.0 to 3.0 gm ⁻²

5. Design and Construction

5.1 Materials

Unless varied by this technical specification, bolts shall be manufactured to property Class 4.6 in accordance with AS 1111.

Nuts shall be manufactured to property Class 6 in accordance with AS 1112.1.

Coach screws shall be manufactured to strength grade 4.6 in accordance with Clause 6 of AS 1393.

Round and square washers shall be manufactured in accordance with QESI Drawings 01-04-02 &. 01-04-01.

Tenderers are to particularly note that both sizes of 75mm square washers (M20 & M24) are to be supplied WITH rounded corners (nominally R6)

5.2 Item List

The items covered by this technical specification are listed in **Appendix A.1**.

5.3 Identification Reference

Prior to galvanising the heads of bolts and coachscrews shall be permanently marked with the Manufacturers trade identification and the property class in accordance with AS/NZS 4291. Nuts shall be marked similarly on one of the hexagon flats. These should be applied in such a way as to remain legible after galvanising.

5.4 Corrosion Protection

All items shall be hot-dip galvanised in accordance with AS 4680 or AS 1214.

5.5 Ratings

All items shall be manufactured to meet the design requirements specified.

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5.6 Dimension and Tolerances

Dimensions and Tolerances shall be in accordance with the relevant Australian Standards except where varied by this specification.

5.7 Finish

The finish of the items shall be in accordance with the relevant Australian Standards with all sharp edges and burrs removed.

5.8 Threads

All bolts shall have a thread length in accordance with Table 1 of AS 1111.1 except where varied by this specification.

All nuts and bolts shall be threaded to tolerance classes of 6H/8g in accordance with Clause 3.6 of AS 1275. Internal threads shall be cut and oiled after galvanising. Details of oil used are to be submitted with the offer and no water-based oils are to be used. Nuts shall run freely for the entire length of the thread.

ALL BOLTS ARE TO BE SUPPLIED WITH NUTS FITTED.

5.9 Shanks

Only full size shank bolts are acceptable in accordance with Table 1 of AS 1111.

5.10 Coach Screws

All coach screws are to be manufactured in accordance with AS 1393.

ALL COACH SCREWS SHALL HAVE GIMLET POINTS.

6. Performance and Testing

6.1 Type Tests

The following type tests are required to be supplied with the tender documents:

ITEM	TEST REQUIREMENTS
Bolts	Tensile strength test as per AS 4291
Nuts	Proof load test as per Clause 8.1 and Table 6 of AS/NZS 4291.2, using sampling plan Table A1 of AS 1393
Coach screws	Hardness test as per Clause 6 of AS 1393, using sampling plan Table A1

6.2 Batch Tests

A "Certificate of Compliance" is to be supplied with each order delivery. Batch Test certificates for mechanical properties, dimensions and galvanising of each item shall be held by the manufacturer and provided to the Purchaser within 24 business hours upon request. These tests are to be in accordance with the relevant Australian Standards.

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7. Risk Assessment

There is no requirement for manufacturer provided safety risk assessments for the items covered by this specification.

8. Quality Assurance

8.1 Purchasers Policy

It is the Purchaser's policy to procure goods, equipment and services from sources that demonstrate the ability to supply quality products.

8.2 Documentary Evidence

Documentary evidence shall be provided concerning the level of quality system certification associated with the supplier and/or manufacturer. This documentation shall include the Capability Statement associated with the Quality System Certification.

8.3 Quality Certification Program

Tenderers shall provide details of their program to upgrade their Quality Certification to meet the requirements of ISO 9001.

9. Samples

When requested, Tenderers shall submit a minimum of six (6) production samples of each item offered as part of the tender package.

10. Packaging and Marking

10.1 Package Lots

All items are to be supplied in packaged lots in accordance with the relevant QESI drawing. Maximum weight of individual package shall not exceed 15kg.

10.2 Package Information

Each packaged lot shall be marked with the following information:

Manufacturers Name
Purchase Order
Item Description
Pack Size
Pack Weight

11. Service Performance

Suppliers shall state:

(a)	The period of service achieved by the items offered within Australian
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	service conditions;
(b)	Australian electricity supply authorities who have a service history of the items proposed for use by the QESI, AND
(c)	Contact names and phone numbers of relevant employees of those supply authorities who can verify the service performance claimed.

12. Reliability

12.1 Service Life

Tenderers are required to comment on the reliability of the equipment and the performance of the materials offered for a service life of 25 years under the specified system and environmental conditions

13. Training

There is no requirement for training associated with this specification.

14. Environmental Considerations

14.1 Environmental Comments

Suppliers are required to comment on the environmental soundness of the design and the materials used in the manufacture of the items offered. In particular, comments should address such issues as recyclability and disposability at the end of service life.

15. Information to be Provided

15.1 Specific Technical Requirements

The specific technical requirements for the items shall be as stated in **Attachment 1** of this specification. The tenderer shall fill in all data requested by **Attachment 1** and shall guarantee such data.

15.2 Checklist of Supporting Documentation

Attachment 2 details a checklist of supporting technical documentation which is required to be submitted with the tender.

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16. Appendix A.1 – List of Specification Items

Bolts, Steel Galvanised, Hex Head, Galvanised Hex Nut, Full Size Shank, Standard Thread Length		
Item	Size	Stock Code
1.	M10 x 25	1702852
2.	M10 x 30	2400007
3.	M10 x 40	1702887
4.	M10 x 65	2400124
5.	M10 x 75	2400190
6.	M10 x 100	1702933
7.	M12 x 25	1703239
8.	M12 x 40	1703255
9.	M12 x 50	1703263
10.	M12 x 60	2400191
11.	M12 x 100	1703328
12.	M12 x 130	1703344
13.	M12 x 150	1703379
14.	M12 x 200	1703417
15.	M16 x 40	1703816
16.	M16 x 75	2400020
17.	M16 x 100	1703867
18.	M16 x 130	1703883
19.	M16 x 140	
20.	M16 x 150	1703905
21.	M16 x 160	1703913
22.	M16 x 180	1703921
23.	M16 x 200	1703948
24.	M16 x 220	1703972
25.	M16 x 240	2400193
26.	M16 x 260	1704006
27.	M16 x 300	1704049
28.	M16 x 400	1704081
29.	M20 x 50	1704367

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Item	Size	Stock Code
30.	M20 x 65	1704375
31.	M20 x 180	1704472
32.	M20 x 200	1704529
33.	M20 x 220	1704502
34.	M20 x 240	1704537
35.	M20 x 260	1704545
36.	M20 x 280	2400026
37.	M20 x 300	1704596
38.	M20 x 325	1704606
39.	M20 x 350	1704626
40.	M20 x 375	1704634
41.	M20 x 400	1704642
42.	M20 x 425	1704669
43.	M20 x 450	1704677
44.	M20 x 475	1704685
45.	M20 x 500	1704693
46.	M20 x 525	2400194
47.	M20 x 550	1704715
48.	M20 x 575	2400027
49.	M20 x 600	1704731
50.	M20 x 650	1704751
51.	M20 x 700	1704782
52.	M20 x 750	2400135
53.	M24 x 400	1705495
Bolts, Steel Galvanised, Hex Head, Galvanised Hex Nut, Full size shank, Minimum Thread Length 100mm		
54.	M20 x 300	
55.	M20 x 350	
56.	M20 x 400	
57.	M20 x 450	
58.	M20 x 500	
59.	M20 x 550	
60.	M20 x 600	

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Item	Size	Stock Code
61.	M20 x 650	
62.	M20 x 700	
63.	M20 x 750	
Bolts, Steel Galvanised, Hex Head, Galvanised Hex Nut, Full size shank, Minimum Thread Length 60 mm		
64.	M16 x 160	
Bolts, Steel Galvanised, Hex Head, Galvanised Hex Nut, Full size shank, Minimum Thread Length 70mm		
65.	M16 x 200	
66.	M16 x 220	
Coachscrew, Steel Galvanised, Hex Head, Gimlet point		
67.	M10 x 50	1757622
68.	M10 x 65	2405924
69.	M10 x 90	2405920
70.	M10 x 100	1757673
71.	M12 x 100	1757894
72.	M12 x 130	1757916
73.	M12 x 150	1757924
74.	M16 x 90	2402970
75.	M16 x 100	1758076
76.	M16 x 130	2400648
77.	M16 x 150	1758106
78.	M24 x 150	1758602
Washer, Flat Round, Steel Galvanised, Large Series		
79.	M10 bolt size	1777534
80.	M12 bolt size	1777542
81.	M16 bolt size	1777569
82.	M20 bolt size	1777577
83.	M24 bolt size	1777593
Washer, Flat Square, Steel Galvanised		
84.	M12 x 50 x 3	1780535
85.	M16 x 50 x 5	1780586

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Item	Size	Stock Code
86.	M20 x 75 x 6	1780594
87.	M24 x 75 x 6	1780616
Nuts, Plain Hex, Steel Galvanised, to fit		
88.	M10 bolt size	1749246
89.	M12 bolt size	1749255
90.	M16 bolt size	1749263
91.	M20 bolt size	1749271
92.	M24 bolt size	1749298

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17. Attachment 1 – Technical Details

NOTE: A separate schedule is to be provided for each item offered except where information common to all items which only needs to be provided once.

PARTICULARS	UNITS	ITEM No.
Manufacturer's Name & Address		
Place of Manufacture		
Manufacturer's Product Catalogue Number		
Are Batch Test Certificates able to be supplied?	Yes/No	
Applicable Australian Standard		
Minimum Failing Load	kN	
Property Class for Bolts		
Property Class for Nuts		
Property Class for Coach screws		
Galvanising Details:		
Method		
Applicable Australian Standard		
Minimum Coating Thickness		
Details of oil used on threads for bolts		
Type Test Certificate No.		
Pack Size		
Pack Weight	kg	

SIGNATURE OF TENDERER: _____

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18. Attachment 2 – Technical Document Checklist

CLAUSE Ref.	PARTICULARS	UNITS
Have full and comprehensive details been submitted WITH the tender documents associated with each of the following items?		
5.3	Identification Reference	Yes/No
6.1	Type test reports	Yes/No
8.3	Quality system of the TENDERER/ MANUFACTURER	Yes/No
8.4	Tenderer's/Manufacturer's programmes to upgrade their quality systems to ISO 9001	Yes/No
11.	Service Performance	Yes/No
12.	Reliability	Yes/No
14.	Environmental Considerations (availability)	Yes/No
15	Information To Be Provided	Yes/No

NAME OF TENDERER:

ADDRESS OF TENDERER: _____

SIGNATURE: _____ FOR AND ON BEHALF OF TENDERER

DATE: _____