



**Ergon Energy Corporation Limited**

# **Technical Specification for Malleable Cast Iron Fittings**

**ETS-01-04-01**

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# Technical Specification for Malleable Cast Iron Fittings

## 1. Purpose and Scope

This technical specification sets out the requirements for the manufacture, testing at works, supply and delivery of malleable cast iron fittings 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 1154	Insulator and conductor fittings for overhead power lines
AS 1214	Hot-dip galvanized coatings on threaded fasteners
AS 1275	Metric screw threads for fasteners
AS 1442	Carbon steels and carbon-manganese steels - Hot-rolled bars and semifinished products
AS 1831	Iron castings - Spheroidal or nodular graphite cast iron
AS 1832	Malleable cast iron
AS 4860	Hot-dipped galvanised (zinc) coatings on fabricated ferrous articles
ISO 9002	Quality Systems - Model for Quality Assurance in Production, Installation and Servicing

## 3. Drawings

### 3.1 Drawings by the Purchaser

The drawings listed in **Appendix A.1** shall be read in conjunction with, and shall form part of this technical specification.

### 3.2 Drawings by the Tenderer

The Tenderer shall supply with the tender, detailed drawings or pamphlets of the items tendered.

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## 4. Service Conditions

The items will be exposed to the following environmental conditions:

<b>Temperatures</b>	45°C summer day time -5°C winter night time
<b>Solar Radiation Level</b>	1 000 W/m <sup>2</sup> with high ultraviolet content
<b>Precipitation</b>	Tropical summer storms with gust winds above 160 km/h, and an annual rainfall in excess of 1 500 mm
<b>Humidity</b>	Extended periods of relative humidity in excess of 90%.
<b>Pollution</b>	Areas of coastal salt spray and/or industrial pollution with equivalent salt deposit densities in the range 2.0 to 3.0 g/m <sup>2</sup>

## 5. Design and Construction

### 5.1 Castings

Castings shall be manufactured from malleable iron to AS 1832, Grades B30-06 or B35-10. Alternatively, spheroidal or nodular graphite iron to AS 1831, Grades 450-12 or 500-7 are acceptable.

### 5.2 Full Details

**Full details of the type of iron to be used shall be submitted in the tender.**

### 5.3 Corrosion Protection

All ferrous items, with the exception of stainless steel, shall be hot dip galvanized in accordance with AS 4860 or AS 1214 and relevant drawings after fabrication.

### 5.4 Workmanship

Castings shall be clean, free from harmful inclusions, blow holes and all other defects and all fins shall be removed before galvanising. The dimensions shall be in accordance with the dimensions shown on the appropriate QESI/ERGON drawings or AS 1154.2.

All holes to accommodate bolts on pins in castings, shall be accurately drilled or cored parallel sided, and in the same straight line.

### 5.5 Bolts, Nuts and Washers

All bolts and nuts shall be threaded in accordance with AS 1111 and AS 1112 respectively. Unless modified by the relevant QESI/ERGON drawing, thread forms shall be of tolerance class 6H/8g. Internal threads shall be cut and oiled after galvanising. Flat and spring washers shall be manufactured in accordance with obsolescent/withdrawn standards AS 1237 and AS 1968 respectively.

### 5.6 Identification Reference

Prior to galvanising, all fittings where specified shall be permanently marked with the appropriate identification reference and with the manufacturer's name or trademark. These should be applied in such a way as to remain legible after galvanising.

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## 5.7 Mechanical Ratings

Items shall have mechanical ratings as specified on the appropriate QESI/ERGON drawing.

## 6. Performance and Testing

### 6.1 Type Tests

The fittings shall be type tested in accordance with AS 1154.1 as detailed in **Appendix A.2**.

**Test certificates giving satisfactory results for the appropriate type tests, made on no fewer than three (3) fittings identical in essential details with those supplied shall be regarded as evidence of compliance and shall be submitted with the tender.**

Type testing shall have been undertaken at a National Association of Testing Authorities (NATA) registered testing laboratory.

### 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.

## 7. Risk Assessment

There is no requirement for manufacturer provided safety risk assessments for the items covered in 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

### 9.1 Production Samples

When requested, Tenderers shall submit a minimum of three (3) production samples of each item tendered as part of the tender package.

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## 10. Packaging and Marking

### 10.1 Package Lots

All items are to be supplied in packaged lots in accordance with the relevant QESI/ERGON drawing.

Each packaged lot shall be marked with the following information:

<b>Manufacturers Name</b>
<b>Purchase Order Number</b>
<b>Contract No.</b>
<b>Stock Code &amp; Item Description</b>
<b>Pack Size</b>
<b>Pack Weight</b>

## 11. Service Performance

Tenderers shall state:

- (a) the period of service achieved by the items tendered within Australian service conditions;
- (b) Australian electricity supply authorities who have a service history of the items tendered; 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 tendered for a service life of 35 years under the specified system and environmental conditions.

## 13. Training

There is no requirement for training associated with this specification.

## 14. Environmental Considerations

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

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## 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 – Drawings

REFERENCE	REVISION	TITLE
01-14-02	B	Clevis Thimble, Cast Iron
01-14-04	B	Socket Thimble, 16 mm
01-14-05	B	Thimble Eye nut

## 17. Appendix A.2 – Schedule of Tests Required

ITEM(s)	CATEGORY OF TEST	CRITERIA FOR TEST	REFERENCE FOR TEST METHOD
Clevis Thimble, Socket Thimble, Thimble Eye nut	1. Mechanical Type Test	<ul style="list-style-type: none"> <li>Minimum Failing Load of 70 kN</li> </ul>	AS 1154.1, Clause 3.2
	2. Batch Tests	<ul style="list-style-type: none"> <li>Verification of Dimensions</li> <li>Galvanising Tests</li> </ul>	AS 1154.1, Clause 3.3
	3. Mechanical Routine Tests	<ul style="list-style-type: none"> <li>Load of 35 kN applied for a period of 30 seconds with no permanent distortion or damage to fitting.</li> </ul>	AS 1154.1, Clause 3.4

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## 18. Attachment 1 – Technical Details

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

Particulars	Units	ITEM No.
Manufacturer's Name and 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	
<b>Galvanising Details:</b>		
Method		
Applicable Australian Standard		
Minimum Coating Thickness	µm	
Details of Oil used on Threads		
Type Test Certificate No.		
Pack Size		
Pack Weight	kg	

**SIGNATURE OF TENDERER:** \_\_\_\_\_

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## 19. Attachment 2 – Technical Document Checklist

Clause Ref.	Particulars	Tenderer's Response
Have full and comprehensive details been submitted <b>WITH</b> the tender documents associated with each of the following items?		
5.1	Property class of iron	Yes/No
6.1	Type test reports	Yes/No
8.2	Quality systems of <b>BOTH</b> the <b>TENDERER</b> and the <b>MANUFACTURER</b>	Yes/No
8.3	Tenderer's/Manufacturer's program to update QA systems to ISO 9001	Yes/No
11	Service Performance	Yes/No
12	Reliability	Yes/No
13	Training Materials (availability)	Yes/No
14	Environmental Considerations (availability)	Yes/No
15	<b>Attachments 1 and 2</b>	Yes/No

NAME OF TENDERER:

ADDRESS OF TENDERER: \_\_\_\_\_

SIGNATURE: \_\_\_\_\_ FOR AND ON BEHALF OF TENDERER

DATE: \_\_\_\_\_