



Ergon Energy Corporation Limited

Technical Specification for General Power and Lighting Cables

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Technical Specification for General Power and Lighting Cables



1. Purpose and Scope

This technical specification sets out the requirements for the manufacture, testing at works, supply and delivery of **general power and lighting cables** for the use on electricity distribution systems in an indoor environment.

Items covered by this technical specification are listed as follows:

Electrical Power Cable Building Wire – Single Core				
Item No.	Cores	Conductors	Colour(s)	Stock Code
1	1	2.5mm ² – 7/0.67	Red	1542706
2	1	2.5mm ² – 7/0.67	Black	1542714
3	1	2.5mm ² – 7/0.67	White	1542722
4	1	2.5mm ² – 7/0.67	Blue	1542749
5	1	2.5mm ² – 7/0.67	Green/Yellow	1542757
6	1	2.5mm ² – 7/0.67	Grey	1542765
7	1	4mm ² – 7/0.85	Red	1542773
8	1	4mm ² – 7/0.85	Black	1542781
9	1	4mm ² – 7/0.85	White	1542803
10	1	4mm ² – 7/0.85	Blue	1542811
11	1	6mm ² – 7/1.04	Green/Yellow	1542919
12	1	6mm ² – 7/1.04	White	1542889
13	1	10mm ² – 7/1.35	Red	1542935
14	1	10mm ² – 7/1.35	Black	1542943
15	1	16mm ² – 7/1.70	Blue	2401141
16	1	16mm ² – 7/1.70	White	2401142
17	1	35mm ² – 19/1.53	Black	1543109
Electrical Power Cable Building Wire – 2 Core + Earth				
Item No.	Cores	Conductors	Colour(s)	Stock Code
18	2+E	2.5mm ² – 7/0.67	White	1541785

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Electrical Power Cable Building Wire – 2 Core				
Item No.	Cores	Conductors	Colour(s)	Stock Code
19	2	2.5mm ² – 7/0.67	Black	2403244
20	2	6.0mm ² – 7/1.04	White	2401145

2. Standards

Unless specified otherwise, the cables must comply with all relevant Australian Standards, in particular:

STANDARD	TITLE
AS 5000.1	Electric Cables - Polymeric Insulated for Working Voltages up to and Including 0.6/1 (1.2) kV
AS 3191	Electric Flexible Cords
AS 3013	Electric installations – Classification of the fire and mechanical performance of wiring system elements
AS 1199.1	Sampling Procedures for Inspection by Attributes
AS 2857-1986	Timber drums for insulated electric cables and bare conductors
ISO 9001:2000	Quality Management Systems
ASTM D1603	Standard Test Method for Carbon Black Content in Olefin Plastics

3. Drawings

There are no drawings for this specification.

4. Design and Construction

4.1 Conductors

Stranded copper conductors are required for items 1 to 19.

4.2 Insulation

Insulation shall comply with the requirements of PVC materials V.90 in accordance with AS/NZS 3808.

4.3 Markings

Markings shall be provided on the cable in accordance with clause 16 of AS/NZS 5000.1.

Meter marking is required for all cable with cross sections of 16mm² or greater.

4.4 Drawings

Contractors shall provide detailed drawings of the cross section of the items offered.

5. Performance and Testing

5.1 General

The purpose of this technical specification, a batch shall be defined as a single production run of a set of input materials used for the output of the item. Where the materials used in the items offered and/or the manufacturing process have changed, a new batch number shall be allocated.

The item shall be tested in accordance with the requirements of Clause 17 of AS 5000.1.

5.2 Type Test Compliance

The cables shall be type tested in accordance with the applicable standards.

5.3 Sample and Routine Tests

5.3.1 Carbon black testing is required where Carbon Black is added for UV Stability. The Carbon Black content of the outer sheath shall be tested in accordance with ASTM D1603. Test Certificates are not required to be despatched with each delivery of cable but shall be made available to the purchaser when requested, within 1 working day.

5.3.2 The successful Tenderer shall submit a sampling test plan in accordance with AS1199.1 "Sampling Procedures for Inspection by Attributes", to be agreed to by Ergon Energy, and nominate the NATA test facility. Other test facilities may be nominated but Ergon Energy approval must be obtained prior to nomination. The test plan submission shall identify the items and quantity to be tested including the frequency of the tests.

5.3.3 All cables offered shall be full sample and routine tested in accordance with the applicable standards where the cable offered will be tested to Standards other than those specified in this technical specification, full details of these Standards are to be provided at the time of tendering.

5.3.4 With each delivery of the items to Ergon Energy, a "Certificate of Compliance" is to be supplied by the Tenderer.

5.3.5 The Certificate of Compliance shall state:

- The Batch number, the Tenderer's name, the name of the Manufacturing Company, the Country of manufacture, and Location name of the manufacture.
- The items have been tested in accordance with the applicable standards.

5.4 Acceptance Tests

Ergon Energy may carry out an acceptance test on the cable to prove it conforms to the requirements of this Technical Specification. Any equipment showing evidence of failure to comply with the requirements of this specification will be liable for rejection.

5.5 Witnessing of Tests

Ergon Energy reserves the right to witness all testing.

The Supplier shall give Ergon Energy reasonable notice of when testing will be carried out.

6. Risk Assessment

Not required for this specification.

7. Quality Assurance

It is expected that Suppliers will have a quality system certified to ISO 9001:2000 in operation. Tenders shall complete Attachment '2'

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. Environmental Considerations

Suppliers are required to complete Attachment '2' and 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.

9. Reliability

Suppliers are required to guarantee the reliability and the performance of the items offered for a service life of 30 years under the specified system and environmental conditions by specifying the guaranteed service life in the Attachment '1'.

Where the specified guaranteed service life is less than 30 years Suppliers are required to provide comment and submit evidence in support of the reliability and performance claimed including detailed information on Failure Mode and Effect Analysis.

10. Traceability

There are no special requirements other than the markings specified in clause 4.3 of this specification.

11. Training

Not required for this specification.

12. Samples

When requested, production samples of each item offered shall be submitted, at no cost to Ergon Energy, to assist in the evaluation of the offer.

Each sample shall be delivered freight free, suitably crated and packaged and labelled with the following information:

- Name of Supplier and this Contract No
- Contract Item Numbers
- Any supporting data on features or characteristics.

Samples shall be delivered within two weeks of the date requested to whom the purchaser advises.

13. Packaging and Drum Marking

13.1 General

Cables with conductor sizes greater than 16mm² shall be supplied on hardwood timber drums manufactured in accordance with the requirements of superseded standard AS 2857-1986. Operational difficulties are anticipated with the use of timber drums manufactured in accordance with AS 2857-1996. The use of plywood or cardboard in drum construction is not acceptable. Alternatives to timber drums, for example plastic drums, will be considered. Full details shall be submitted by the Tenderer.

All other cable sizes shall be supplied in 100m lengths. The Tenderer shall nominate the type and size of drums.

13.2 Lagging

The cable on the drum shall be protected by external lagging to ensure that it is delivered undamaged giving due consideration to the methods and distance of transportation and handling.

The Contractor shall provide details in Attachments '1' concerning the method to be used.

13.3 Drum Durability

The cable drums shall be sufficiently robust to ensure that the cable is delivered undamaged, giving due consideration to the method of transport and the distances involved.

All drums shall be of suitable quality to withstand a minimum of twelve (12) months exposure from the time of receipt by Ergon Energy to all types of weather conditions during outdoor storage without deterioration.

13.4 Drum Surface

The surface of the barrel shall be free from irregularities harmful to the cable.

Drum surface treatment to protect against weather, the environment, galvanic action, and corrosion is required.

Contractors shall state the type of surface treatment applicable to drums for each item.

13.5 Marking of Drums

Drums/package shall be marked in accordance with clause 16.4 of AS/NZS 5000.1

13.6 Fixing of Cable End

The inner end of the cable shall be secured to the drum to ensure that the end will not flick off the drum barrel when the cable is being run out.

13.7 Quarantine Requirements

Should the items offered be supplied from overseas manufacturers, then it is mandatory that all conditions and inspections required by the Australian Quarantine Act be met and that all these costs be included in the tendered price. In particular, timber crates shall be

fumigated with methyl bromide. The Contractor shall ensure that the procedure does not produce any deleterious effects to the conductor or stay wire or the drums.

14. Service History

Potential first time Suppliers to the Purchaser shall state:

- The period of service achieved by the items offered within the environmental conditions outlined in Clause 5.1 of this document;
- Australian electricity supply authorities who have a service history of the items offered;
- Contact names and phone numbers of relevant employees of those authorities who can verify the service performance claimed.

15. Information To Be Provided

The specific technical requirements for the items offered shall be as stated in Attachment '1' of this specification. The supplier shall provide all details requested by Attachment '1' and shall guarantee such data. A separate Schedule / Column of a Schedule shall be completed for each item offered.

The supplier shall provide Management Systems information and respond to the referenced items in Attachment '2' of this specification.

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16. Attachment '1'

Technical Details

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

PARTICULARS	UNITS	ITEM NUMBER:
Contractor's Name and Address		
Manufacturers Name and Address		
Place of Manufacture		
List of Standards used for Tests		
Cable Details:		
Conductor sizing and stranding	No./mm ²	
Insulation designation and colour		
Radial thickness of insulation	mm	
Sheath designation and colour		
Maximum dc resistance of core @ 20oC	/km	
Fire Resistance Classification		
Metre Marking provided	Yes / No	
Nominal voltage rating	V	
Overall diameter of cable	Mm	
Mass of cable	Kg/m	
Guaranteed Service Life	Years	
Packaging Details:		
Type of Drum		
AS 2857-1986 Drum Designation (If applicable)		
Spindle Hole Diameter	mm	
Method of lagging		
Length of Cable per Drum	M	
Gross Mass of Drum, Cable and Protective External Lagging	Kg	
Mass of Drum and Cable	Kg	
Drum Surface Treatment (Timber):		
Barrel		
Drum Surface Treatment (Timber):		
Internal Surface Flanges		

Name & Signature of Supplier / Date:

Address:

Name & Signature of Witness / Date:

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17. Attachment '2'

Management Systems Information

Supplier Details

Supplier:	Representative's Name:
Address:	Telephone: Facsimile: Mobile / Other:
Product Description and Number:	ABN:

Quality Assurance

Do you have a fully implemented Quality Management System in place which has been certified by an external certification body? (3 rd Party Industry Specific Certification)	YES / NO
If YES, advise name of certification body and Certificate number. Attach a copy of the certificate and Standard number.	Certified by: Certificate Number:

Environmental

Do you have a fully implemented Environmental Management System in place which has been certified by an external certification body? If YES attach a copy of the certificate.	YES / NO
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If YES you may skip the rest of this attachment.

Do you have an Environmental Management Policy that is available to the purchaser within 7 days of request?	YES / NO
Do you have a formal Environmental Management Plan that is available to the Purchaser within 7 days of request that outlines how you will address environmental risks relevant to your activities and conditions?	YES / NO
Are the requirements of your Environmental Management Plan incorporated into your Work Procedures?	YES / NO
Do you have a fully implemented Environmental Management System in place in accordance with ISO14001 which has been certified by an external certification body?	YES / NO
If YES, advise name of certification body and Certificate number. Attach copy of certificate and Standard number.	
Copy of Certificate and Schedule(s) attached.	YES / NO

Name of Supplier:

Signature:

Date:

18. Attachment '3'

Technical Documentation Checklist

CLAUSE REF.	PARTICULARS	UNITS
	Have full and comprehensive details been submitted WITH the tender documents associated with each of the following items?	
4.4	Detailed drawings of the cross-section of the item	Yes / No
5	Test certificates specified in relevant Australian Standards	Yes / No
13.1	Do drums comply with AS 2857-1986	Yes / No
13.2	Method of lagging for cable drums	Yes / No
13.5	Method of drum surface treatment	Yes / No
15.1	Completed Attachment '2'	Yes / No
6	Quality systems of both Supplier and Manufacturer including Capability Statement	Yes / No
8	Environmental Considerations	Yes / No
9	Reliability	Yes / No
14	Service History	Yes / No

Name & Signature of Supplier / Date:

Address:

Name & Signature of Witness / Date: