

MATERIAL SPECIFICATION

VOCAB NUMBER	ITEM DESCRIPTION
132148	PARALLEL GROOVE CLAMP FOR ALUMINIUM TO COPPER CONDUCTORS, RANGE ALUMINIUM (COPPER 7.5-22.5, COPPER 7.5-20MM DIAMETER, 35-300MM², COPPER 35-240MM² CROSS SECTIONAL AREA)

SPECIFICATION DETAILS

As per specification attached.

- **Unit of Measure:** Each
- **Rejection:** PNG Power Ltd reserves all rights to reject whole or part of the order not complying with this specification and is not liable for any cost or loss with the return of rejects to the Supplier. Facilitation of Invoice Credit must commence between the supplier and PNG Power Ltd through the process of PNG Power Ltd Discrepancy Report provisions.

Drawing References:

Manufacturer's Product Code:

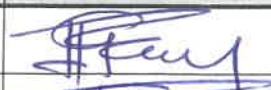


STANDARDS COMMITTEE APPROVAL

Approval by Alex Oa
Chairman

Signature: 

Date: 30, 6, 2015

DATA REVIEW ENDORSEMENT

NAME	TITLE	SIGNATURE	DATE
Grevasias Peni	Team Leader Standards and Materials		29/6/15
	//		29/07/19

SPECIFICATION FOR OVERHEAD LINE NON-TENSION CONNECTORS, VOCAB: 132148
1.0 SCOPE:

The specification provides for the supply, manufacture, testing and delivery of overhead line non-tension connectors into PPL stores at the stated locations.

2.0 REQUIREMENTS:

The technical description and design particulars of the overhead lines non-tension connectors shall be in accordance with Appendix 1. Details of connectors offered shall be stated in Appendix 2. These Appendices are attached and form part of this specification.

3.0 APPLICATION:

The overhead line non-tension connectors will be used on PPL's overhead power lines throughout Papua New Guinea and may be subjected to coastal atmospheric conditions and industrial pollution.

4.0 STANDARDS:

The overhead line non-intension connectors will be used on PPL's overhead power lines throughout Papua New Guinea and maybe subjected to coastal atmospheric conditions and industrial pollution.

AS	1444	Wrought Alloy Steel – AISE – SAE Standard, Hardenability (H) and Stainless Series
AS	1214	Hot Dip Galvanised Coatings on Threaded fasteners
AS	1531	Aluminium Conductors for Overhead Power Transmission Purposes
AS	1746	Hard Drawn Copper Conductors for Overhead Power Transmission Purposes
AS	1275	Metric Screw Threads for Fasteners
AS	1110	ISO Metric Hexagon Precision Bolts and Screws
AS	K141	Electroplated Coatings of Tin
AS	1112	ISO Metric Hexagon Nuts including Thin Nuts, Slotted Nuts and Castle Nuts
ESAA D (b) 5		Current ratings of Bare Overhead line Conductors
VDE 0212/5.62		Guidelines for Insulator Strings and Conductor Accessories for Overhead Power Lines
AS	1154 Part 1	Insulator and Conductor Fittings for Overhead Power Lines – Performance General Requirements
AS	1650	Galvanised Coatings

SPECIFICATION FOR OVERHEAD LINE NON-TENSION CONNECTORS, VOCAB: 132148**5.0 CONNECTOR PERFORMANCE REQUIREMENTS:****5.1 General**

Connectors shall be of materials which are resistant to weathering influences and parts of the connector which are in direct contact with the conductor must either be of the same material in the form of an alloy or of a material which does not cause interface or environment corrosion.

Connectors shall generally be of a two part design suitable for the practical non load disconnection from an energised line.

5.2 Stability

Connectors shall have proven test or service performance results which shall show the particular connector's long term effectiveness in respect of stability of mechanical load and stability of contact resistance.

Stability of mechanical load shall be achieved by the use of tension plates, spring washers or inherent connector body tension.

5.3 Installation

Connectors shall be designed for ease of installation and a bolted design shall allow connection to the largest through the conductors and the tap conductor without total removal of clamping screw nuts or clamping screws.

5.4 Electrical Ratings

Connectors shall have a continuous current rating at least equivalent to the current rating of the largest connectors recommended for the fitting. In the case of aluminium based conductors, rating shall be referred to the current rating of the aluminium conductors of the maximum cross-sectional area. The connector should not develop a temperature higher than that of the equivalent length of tree conductor.

5.5 Connector Material for Aluminium Based Conductor

Connectors for aluminium based conductors shall be wrought or cast aluminium alloys as long as these alloys have practically the same corrosion resistance as pure aluminium.
RECAST ALLOYS ARE NOT ACCEPTABLE.

5.6 Forgings and Pressings

All parts shall preferably be shaped by the pressing, forging or cutting of pressed drawn or rolled semi-finished products. The parts shall be carefully shaped so as to fit each other in satisfactory manner. Burrs and sharp edges which may cause conductor damage or employee injury shall be removed.

5.7 Castings

Castings shall be impervious and free of pores and slag.

5.8 Surface

The surface of the connectors in particular the contact surfaces should not contain impurities which would impair operational life. The contact surfaces of connectors used on aluminium based conductors shall be provided with accurately designed transverse grooves to provide penetration of the conductor oxide layer and increase contact making areas.
LONGITUDINAL GROOVES ARE NOT ACCEPTABLE.

SPECIFICATION FOR OVERHEAD LINE NON-TENSION CONNECTORS, VOCAB: 132148**5.9 Ferrous Materials**

Ferrous materials except for stainless steel shall not be hot dipped galvanised in accordance with AS 1214 and shall comply with the testing requirements of AS 1650.

5.10 Aluminium – Copper Connectors

These connectors shall be designed such that the aluminium/copper surface junction is well protected against corrosion by a permanent layer or covering of insulating material applied to the exposed bi-metal interface or by other methods which from tests show negligible corrosion effects.

5.11 Screws, Nuts and Ancillaries

Hexagonal head screws, hexagonal nuts and ancillaries such as Bellville washers, spring washers and pressure plates shall be of a material compatible for use with the particular connector and shall generally be as follows:-

- (i) Screws - Hexagonal head, steel hot dipped galvanise to AS 1214, thread tolerance 8G to AS 1275
- (ii) Nuts - Hexagonal, steel hot dipped galvanise to AS 1214, thread tolerance 6H to AS 1275
- (iii) Ancillaries - Steel, hot dipped galvanise to AS 1650

Alternatively stainless steel AS 1444/316 may be used in lieu of hot dipped galvanised steel.

5.12 Marking

Connectors shall be marked with the manufacturer's mark and the conductor cross-sectional areas or the conductor diameters for which the connectors are designed.

6.0 SAMPLES

Samples may be required for inspection during quotation evaluation, particularly if the items being offered have not previously been purchased by PPL.

7.0 TESTING**7.1 General**

Each connector offered shall have been subjected to artificial ageing, electrical and mechanical type tests carried out by a NATA or equivalent certified test laboratory and copies of test reports shall be submitted with the Quotation.

7.2 Acceptable Type Tests

Tenderers have the option to apply a recognised type test programme. However for the information of tenderers a type test programme acceptable to PPL as follows:-

7.3 Mechanical Test

In accordance with Sub Section 5.2 of AS 1154, Part 1 - 2009

Electrical Test

In accordance with Section 18 of VDE 0212/5.62

8.0 UNIT OF MEASURE

Unit of measurement is in Each.

SPECIFICATION FOR OVERHEAD LINE NON-TENSION CONNECTORS, VOCAB: 132148**9.0 REJECTION:**

Overhead line non-tension connectors rejected during the acceptance inspection shall remain the responsibility of the Contractor. No payment will be made for rejected items.

10.0 GUARANTEES:

- 10.1 For a period of twelve calendar months after the overhead line non-tension connectors have been installed, the Contractor shall be responsible for any defect that may develop under proper use arising from faulty materials, design or workmanship in the goods. The Contractor shall remedy these defects when the overhead non-tension connectors are made available by PPL, which shall state in writing to what respect any portion is faulty.
- 10.2 PPL shall notify the Contractor on the failure of any part. Such notifications may be given in writing by a responsible officer of PPL and shall be taken to have been received if left at the Contractor's last known place of business.
- 10.3 PPL reserves the right to proceed immediately with repairs to or replacement of any parts as may be necessary.
- 10.4 If it becomes necessary for the Contractor to replace or renew any defective portion of the goods under this clause, the provision of this clause shall apply to the portion of the goods replaced or renewed until the expiration of twelve months from the date of such replacement or renewals.

11.0 DIVISIONS OF ORDERS:

PPL reserves the right to divide the order and accept any item from any manufacturer.

12.0 INFORMATION TO BE SUPPLIED WITH QUOTATION:

- 12.1 Appendix 2 to be completed and signed
- 12.2 Schedule of forecast requirements and offer Part 1, 2 and 3
- 12.3 Copies of test reports in accordance with clause 7.0
- 12.4 Failure to furnish the information called for in the specification and the attached Appendix 2 may render the quotation liable to rejection.
- 12.5 All alternative departures and/or omissions from the specification shall be clearly set out. If there are alternatives, information as requested shall be supplied for each alternative

13.0 PACKING

Packing shall be in accordance with PPL's conditions of Purchase Order Sections 2 and 3.

14.0 SAMPLES

Samples must be supplied with each other.