

**PRODUCT SPECIFICATION**  
**THERMAL RESISTANCE ALUMINIUM ALLOY RODS**  
**GRADE AT 1 (60 TAL)**

**1.0 SCOPE:**

This specification is main to Thermal Resistance Aluminium Alloy, grade AT 1 (60TAL) rods produce by Press Metal Aluminium Rods Sdn. Bhd.

**2.0 REFERENCED SPECIFICATIONS:**

IEC 62004                      Thermal Resistance Aluminium Alloy Wire for overhead line conductor  
 ASTM B 233                  Aluminium 1350 Drawing stock for electrical purpose.

**3.0 TECHNICAL SPECIFICATION:**
**3.1 DIAMETER**

Specified diameter (mm)	Deviation of mean diameter from specified diameter (mm)	Deviation at any point from specified diameter (mm)
9.52	± 0.51	± 0.76

**3.2 TENSILE & ELONGATION**

Description	Tensile Strength kgf/mm <sup>2</sup>	Tensile Strength Mpa	Elongation % at 250mm GL (Min)
AT 1	10.5 - 14.5	103 - 142	4.0

\*GL - guage length

**3.3 CONDUCTIVITY & RESISTIVITY**

Description	Minimum Conductivity % IACS, Min	Volume electrical resistivity at 20°C ohm.mm <sup>2</sup> /m, Max
AT 1	60.0	0.028735

**3.4 CHARACTERISTIC**

Description	Unit	
Specific gravity	g/cm	2.703
Temperature coefficient at 20 °C	per °C	0.00400

### 3.5 THERMAL RESISTANCE PROPERTY

Duration (hour)	Temperature, °C	AT 1
1	Temperature of heating	230
	Tolerance in temperature	+5 , -3
400	Temperature of heating	180
	Tolerance in temperature	-6

\* The residual ratio of the tensile stress after heating the rods for the designated duration and temperature in clause 3.5 shall not be less than 90% at room temperature compared with the initial value before heating.

### 3.6 CHEMICAL COMPOSITION

Element	Composition (%)
Silicon	Max: 0.10
Iron	Max: 0.40
Copper	Max: 0.05
Manganese	Max: 0.01
Chromium	Max: 0.01
Zinc	Max: 0.05
Boron	Max: 0.05
Zirconium	0.01 - 0.1
Gallium	Max: 0.03
Vanadium & Titanium	Max: 0.02
Other elements, each	Max: 0.03
Other elements, total	Max: 0.10
Aluminium	Min: 99.5

### 4.0 FINISHING & APPEARANCE

The Aluminum Rod is supplied in the form of a continuous coil without any joints. The Rod shall be clean, without any excessive oil & grease, of uniform lustre, smooth and free from flakes, cracks, kinks, dents, twists, and other injury or defects.

### 5.0 PACKAGING

The coil shall be supplied with following dimension:

Inner diameter	Approximately 500mm
Outer diameter	1500mm maximum
Height	850mm to 950mm

The nominal weight for each coil approximately  $2000 \pm 200$ kg.

Each coil shall be securely strapped to a timber pallet. The pallet shall be dry or free from moisture to prevent insect or fungal attack.

Adequate protection shall be provided to prevent corrosion or physical damage to the coil.

Each coil shall be wrapped with a blank polyethylene in order to be protected from damage and prevent contamination to the rods surface which might cause from the environment.

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## 6.0 MARKING

Each coil shall be attached with waterproof label on the outside of the coil with following information:

- 1) Customer name
- 2) Material type and grade
- 3) Nominal finished rod diameter
- 4) Tested mechanical properties ( Tensile and Elongation)
- 5) Conductivity
- 6) Net and gross weight
- 7) Coil identification number
- 8) Manufacturing date

## 7.0 TEST CERTIFICATES

Test certificate shall be provided to customer upon or precede delivery. The contents inside the Test Certificate shall be as follows:

- 1) Customer's name
- 2) Material type and grade
- 3) Delivery Order number
- 4) Net weight
- 5) Testing result for Clause 3.0

\*Requisition for additional information inside the Test Certificate shall be considered.

## 8.0 QUALITY ASSURANCE

All products are manufactured to meet the standard specification that been agreed between Press Metal Aluminium Rods Sdn Bhd and customer. Each of our product been tested with reliable testing equipment. Manufacturing of this product has considered the restriction of hazardous element usage stated in REACH and ROSH directive.