

**TEST REPORT**

CERTNO:VL/TC/WR/C/SC1111001181

DATE/TIME:06.08.2018/11:32:09

TO:

CONSIGNEE

MIRACLE CABLES INDIA PVT.LTD.

Unit- 3#

K-29/2, MIDC, Additional Ambarnath,  
Anand Nagar, Ambarnath (East),, India

BUYER

MIRACLE CABLES INDIA PVT.LTD.

Unit- 3#

K-29/2, MIDC, Additional Ambarnath,  
Anand Nagar, Ambarnath (East),, India

Invoice No : SC1111001181 Dated 06.08.2018

Description/Condition of the sample : Continuous Cast Copper Wire Rod

Identification of the method :

Ref.ASTM Stds

Ref.of Sampling

1.Conductivity ---&gt; Resistance measurement.

B193

WI/QC/05

2.Tensile strength/Elongation---&gt; Tension.

E8M

WI/QC/09

3.Surface oxide ---&gt; Electrolysis.

B49

WI/QC/02

4.Oxygen ---&gt; IR cell resistance variation.

E2575

WI/QC/01

5.Sulfur--- &gt; IR cell absorption spectrometer.

B115

WI-QC-FPI-03

6.Chemical ---&gt; Atomic emission spectrometer .

B115

WI-QC-FPI-16

7.Diameter--- &gt; OD measurement.

B49

WI/QC/03

Sample Identification : H1805366 H1805367 H1805368 H1805369 H1805371 H1805372 H1805386

Date of receipt/Sampling/Testing : 05.08.2018

Location of Sampling : CCR QA Laboratory. VL SILVASSA.

The Test results are as under :

|           | Conductivity | Elongation | Surface   | Tensile   | Oxygen  | Diameter | Net    |
|-----------|--------------|------------|-----------|-----------|---------|----------|--------|
|           | IACS         | (250mm)    | Oxide     | Strength  |         |          | Weight |
|           | 100 (Min)    | 30 (Min)   | 750 (Max) | 210 (Min) | 100-650 | 8.00 +/- |        |
| Coil Nos. | %            | %          | Angstrom  | Mpa       | ppm     | 0.38 mm  | MT     |
| H1805366  | 101.56       | 40.4       | 229       | 221.58    | 282     | 7.91     | 3.212  |
| H1805367  | 101.61       | 40.4       | 229       | 221.58    | 282     | 7.91     | 3.246  |
| H1805368  | 101.61       | 40.4       | 229       | 221.58    | 282     | 7.91     | 3.221  |
| H1805369  | 101.61       | 40.4       | 229       | 221.58    | 282     | 7.91     | 3.251  |
| H1805371  | 101.61       | 40.4       | 184       | 221.86    | 245     | 7.91     | 3.253  |
| H1805372  | 101.61       | 40.4       | 184       | 221.86    | 245     | 7.91     | 3.237  |
| H1805386  | 101.61       | 40.4       | 320       | 221.58    | 313     | 7.91     | 1.022  |

Visual Inspection : Good/ free from surface Imperfection

The actual chemical composition is as under :

| Coil Nos. | Cu % Min | Te   | Se   | Bi   | Sb   | As   | Sn   | Pb   | Fe   | Ni   | S    | Ag   |
|-----------|----------|------|------|------|------|------|------|------|------|------|------|------|
| ppm<      | >99.90   | 2    | 2    | 1    | 4    | 5    | 5    | 5    | 10   | 10   | 15   | 25   |
| H1805366  | 99.970   | 0.20 | 0.20 | 0.20 | 0.37 | 0.37 | 0.20 | 1.43 | 2.91 | 1.45 | 3.00 | 7.31 |
| H1805367  | 99.970   | 0.20 | 0.20 | 0.20 | 0.37 | 0.37 | 0.20 | 1.43 | 2.91 | 1.45 | 3.00 | 7.31 |
| H1805368  | 99.970   | 0.20 | 0.20 | 0.20 | 0.37 | 0.37 | 0.20 | 1.43 | 2.91 | 1.45 | 3.00 | 7.31 |
| H1805369  | 99.970   | 0.20 | 0.20 | 0.20 | 0.37 | 0.37 | 0.20 | 1.43 | 2.91 | 1.45 | 3.00 | 7.31 |
| H1805371  | 99.974   | 0.20 | 0.20 | 0.20 | 0.37 | 0.37 | 0.20 | 1.43 | 2.91 | 1.45 | 3.00 | 7.31 |
| H1805372  | 99.974   | 0.20 | 0.20 | 0.20 | 0.37 | 0.37 | 0.20 | 1.43 | 2.91 | 1.45 | 3.00 | 7.31 |
| H1805386  | 99.967   | 0.20 | 0.30 | 0.20 | 0.21 | 0.42 | 0.20 | 2.60 | 1.58 | 0.51 | 6.00 | 6.51 |

Copper wire Rod manufactured using LME grade "A"/Grade1/Cu CATH-1 cathode and meets the requirement of ASTM B49/BS EN-1977 and also equivalent to IS-12444 requirement.

(Authorized Signatory)

Note:

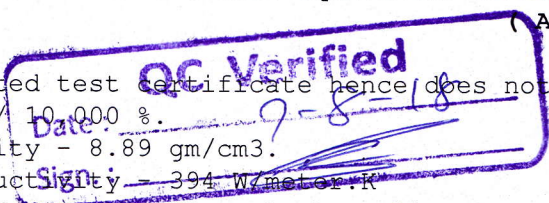
1.This is computer generated test certificate hence does not require signature.

2.Conversion : 1 PPM = 1 / 10,000 %.

3.Copper Properties: Density- 8.89 gm/cm3.

Thermal Conductivity - 394 W/meter.K

4.The product is certified with "ROHS" &amp; also complies "REACH" requirement



**TCR ENGINEERING SERVICES PVT.LTD.****TRUST - COMPETENCE - RELIABILITY**

Chairman - Emeritus  
VIRENDRA K. BAFNA  
B. E. M. Eng. (Canada)  
M.S.I.M. (U.S.A.) M. A. S. T. M

TCR / QF / 5101

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Certificate No. NABL-T-367,  
NABL-T-368 & NABL-T-3304  
NABL ISO 17025  
ACCREDITED LABORATORY

**TEST CERTIFICATE**

Page 1 of 2

Date: 22-08-2018

**T.C. No.** : BR8511  
**Issued To.** : M/s MIRACLE CABLES (INDIA) PVT. LTD.  
Plot No.K-29/2, MIDC, Anand Nagar, Additional Ambernath,  
Ambernath (E) 421501

|                         |                            |                            |              |
|-------------------------|----------------------------|----------------------------|--------------|
| <b>Party Ref.</b>       | : Letter                   | <b>Condition of Sample</b> | : Cut length |
| <b>Ref. Date</b>        | : 08-08-2018               |                            |              |
| <b>Nature of Sample</b> | : Copper Rod - Vedanta     |                            |              |
| <b>Specification</b>    | : ASTM B49 - 17 UNS C11040 | <b>Sample Received on</b>  | : 09-08-2018 |
| <b>Sample Drawn By</b>  | : Party                    | <b>Date of Completion</b>  | : 22-08-2018 |
|                         |                            | <b>Enclosure</b>           | : NIL        |

**Test** : Tensile, Spectro Chemical\*

Coil No H1805372  
Size 8 mm Dia

**TENSILE TEST****Test Method : ASTM E8 2016**

Equipment : KIC - 2 / 0 - 100 KN

|                                         |          |
|-----------------------------------------|----------|
| Gauge diameter (mm)                     | 7.97     |
| Cross-sectional area (mm <sup>2</sup> ) | 49.89    |
| Original gauge length (mm)              | 250.00   |
| Ultimate tensile load (N)               | 10628.00 |
| U.T.S (N/mm <sup>2</sup> )              | 213.03   |
| Final gauge length (mm)                 | 338.68   |
| Elongation (%)                          | 35.47    |
| Fracture                                | WGL      |
| Remark                                  | Pass     |

Party's  
Requirement

210 min.

30 min.

*Memo*  
A. P. INAMDAR (MGR INT)

*h*  
S. S. SHANBHAG  
(HEAD-Technical)



1) The results relate only to the sample tested.  
2) Test Certificate shall not be re-produced except in full without the written approval of laboratory.  
3) While 'TCR' has made their best endeavors to provide accurate and reliable information, 'TCR' is not responsible for any financial / legal liability due to any act of omission or error made. T & C Overleaf  
4) NABL Cert No. T - 0367 - Chemical Testing, T - 0368 - Mechanical Testing, T-3304 - Non Destructive Testing.

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NABL-T-368 & NABL-T-3304  
NABL ISO 17025  
ACCREDITED LABORATORY

**TEST CERTIFICATE**

Page 2 of 2

**T.C. No. : BR8511****Date: 22-08-2018****Issued To. : M/s MIRACLE CABLES (INDIA) PVT. LTD.**

Plot No.K-29/2, MIDC, Anand Nagar, Additional Ambernath,  
Ambarnath (E) 421501

**Test : Tensile, Spectro Chemical\***

Coil No H1805372  
Size 8 mm Dia

**SPECTRO CHEMICAL TEST\***

|                 |       | Test Method   | Requirement |
|-----------------|-------|---------------|-------------|
| % Copper        | 99.96 | TCR/TM-AAS-02 | 99.95 min.  |
| Silver (PPM)    | 10.0  | TCR/TM-AAS-02 | 25 max.     |
| Lead (PPM)      | 1     | TCR/TM-AAS-02 | 5 max.      |
| Iron (PPM)      | 2     | TCR/TM-AAS-02 | 10 max.     |
| Tin (PPM)       | 1     | TCR/TM-AAS-02 | 5 max.      |
| Bismuth (PPM)   | 1     | TCR/TM-AAS-02 | 1 max.      |
| Nickel (PPM)    | 2     | TCR/TM-AAS-02 | 10 max.     |
| Sulphur (PPM)   | 10    | ASTM E1019-11 | 15 max.     |
| Arsenic (PPM)   | 1     | TCR/TM-AAS-02 | 5 max.      |
| Tellurium (PPM) | 1     | TCR/TM-AAS-02 | 2 max.      |
| Selenium (PPM)  | 1     | TCR/TM-ICP-02 | 2 max.      |
| Antimony (PPM)  | 2     | TCR/TM-ICP-02 | 4 max.      |
| Remark          | Pass  |               |             |

Note : " The tests marked with an \* are not accredited by NABL"

\*\*\*\*\*END OF REPORT\*\*\*\*\*

vk/-

**Checked By****Issued By****A. P. INAMDAR (MGR INT)****Authorised Signatory****S. S. SHANBHAG  
(HEAD-Technical)**

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