DATA SHEET:

# TS Britton M3 4.5 2 (12.78) IEC 212

Governing Units: Metric

| Mechanical Specifications | Metric | | Imperial | |
|---|---|---|---|---|
| Fully Annealed Al Cross-sectional Area* | 107.37 | $mm^2$ | 211.88 | kcmil |
| Encapsulated Aluminum Cross-Sectional Area | 40.84 | $mm^2$ | 0.06330 | $in^2$ |
| Diameter of Composite Core (Exclude Encapsulation) | 4.5 | mm | 0.17700 | in |
| Cross-sectional Area of Core (Exclude Encapsulation) | 15.90 | $mm^2$ | 0.02465 | $in^2$ |
| Overall Diameter of Conductor | 12.780 | mm | 0.503 | in |
| Cross-sectional Area of the Conductor (Exclude Covering) | 123.30 | $mm^2$ | 0.19107 | $in^2$ |
| Ultimate Tensile Strength of Conductor 1) ,2) | 50.49 | kN | 11.35 | kip |
| Rated Strength of Core - 399 ksi (2750 MPa) | 43.68 | kN | 9.82 | kip |
| Core Mass per unit length (Exclude Encapsulation) | 28.00 | kg/km | 18.82 | lb/kft |
| Conductor Mass per unit length | 321.12 | kg/km | 215.82 | lb/kft |
| Fully Annealed AlMass per unit length (Include Encapsulation)** | 293.12 | kg/km | 197.00 | lb/kft |
| Maximum Emergency Temperature at Surface 3) | 200 | °C | 392 | °F |
| Coefficient of Linear Expansion Above Thermal Kneepoint (core) | 0.500 | $x10^{-6}$/°C | 0.278 | $x10^{-6}$/°F |
| Coefficient of Linear Expansion Below Thermal Kneepoint (conductor) | 16.723 | $x10^{-6}$/°C | 9.291 | $x10^{-6}$/°F |
| Final Modulus of Elasticity Above Thermal Kneepoint (based on core area) | 150.0 | GPa | 21.8 | Msi |
| Final Modulus of Elasticity Below Thermal Kneepoint (based on conductor area) | 69.1 | GPa | 10.0 | Msi |
| Aluminum Heat Capacity | 275.2 | Watt-s/m-°C | 46.6 | Watt-s/ft-°F |
| Core Heat Capacity | 23.5 | Watt-s/m-°C | 4.0 | Watt-s/ft-°F |
| Encapsulation Thickness | 2.00 | mm | 0.07874 | in |
| Stranding Ratio | 1.0200 | | | |
| Covered Thickness | 0.000 | mm | 0.000 | in |
| **Electrical Specifications** | **Metric** | | **Imperial** | |
| DC Resistance at 20ºC (Fully Annealed Al 63% IACS) | 0.2580 | ohm/km | 0.4153 | ohm/mile |
| DC Resistance at 25ºC | 0.2633 | ohm/km | 0.4237 | ohm/mile |
| DC Resistance at 75ºC | 0.3159 | ohm/km | 0.5085 | ohm/mile |
| Temperature Coefficient of Resistance at 20ºC | 0.00408 | 1/°C | 0.00227 | 1/°F |
| Frequency | 50 | Hz | 50 | Hz |
| AC Resistance at 25ºC | 0.2635 | ohm/km | 0.4240 | ohm/mile |
| AC Resistance at 75ºC | 0.3161 | ohm/km | 0.5087 | ohm/mile |
| AC Resistance at 180ºC | 0.4266 | ohm/km | 0.6865 | ohm/mile |
| Ampacity 4) | | 640 | @180°C, & A | |
| | | 672 | @200°C, & A | |
| GMR (estimated) | 5.22 | mm | 0.0171 | ft |
| Inductive Reactance (Xa: internal flux+external flux radius 1 ft) | 0.2555 | ohm/km | 0.411 | ohm/mile |
| Capacitive Reactance | 0.2214 | Mohm-km | 0.138 | Mohm-mile |

*TS Britton M3 4.5 2 (12.78) IEC 212 conductor is produced with Fully Annealed Al aluminum. The nominal Aluminum equivaelnt area is 107.4 sq. mm (211.9 kcmil)

**TS® Conductors are required to exhibit lay lengths (ratios) that conform to established ACSR and ACSS standards.

1) Fully Annealed Al rated tensile strength based on applicable standard. Core tensile strength based on 100% of its strength.

2) Strength at ambient temperature, Strength may be reduced to Rated Core Strength when temperature is above knee point

3) Maximum continuous operating temperature of TS Britton M3 4.5 2 (12.78) IEC 212 is 180°C and a maximum emergency temperature of 200°C

4). Ampacity based on: 25°C ambient temperature, 2ft/s (0.6 m/s) perpendicular wind, 0.5 Emis 0.5 Absorb.50 Hz, sea level (0) elevation, 30°N line Azimuth, noon on June 10th (96W/sq.ft, 1033W/sq.m), clear atmosphere

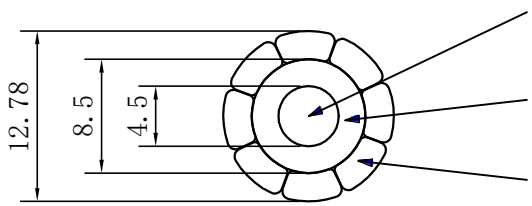


contact: info@tsconductor.com

ID:46969 Date Produced: 12/5/2023

Units: mm

# TS Conductor Britton Cross sectional drawing




Carbon fiber composite core :
Nominal diameter=4.5mm

Aluminium Encapsulation:
Thickness = 2.0mm

Trapezoidal shaped annealed aluminium wires:
Numbers=8 Nominal area=8.32 $mm^2$

| TS Conductor Corp. | | | |
|---|---|---|---|
| TS Conductor Britton | | | |
| Design | | Date | 11.08.2022 |
| Check | | Date | 11.08.2022 |
| Ratify | | Date | 11.08.2022 |