

DATA SHEET:

TS Santanoni M3 4.5 (0.563) 271



Governing Units: Metric

| Mechanical Specifications | Metric | | Imperial | |
|---|---------|-----------------------|-------------|-----------------------|
| Fully Annealed Al Cross-sectional Area* | 137.25 | mm ² | 270.86 | kcmil |
| Encapsulated Aluminum Cross-Sectional Area | 38.20 | mm ² | 0.05921 | 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 | 14.300 | mm | 0.563 | in |
| Cross-sectional Area of the Conductor (Exclude Covering) | 153.20 | mm ² | 0.23739 | in ² |
| Ultimate Tensile Strength of Conductor 1) ,2) | 52.13 | kN | 11.72 | 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 | 402.95 | kg/km | 270.82 | lb/kft |
| Fully Annealed Al Mass per unit length (Include Encapsulation)** | 374.95 | kg/km | 252.00 | 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) | 17.723 | x10 ⁻⁶ /°C | 9.846 | 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) | 66.0 | GPa | 9.6 | Msi |
| Aluminum Heat Capacity | 351.8 | Watt-s/m-°C | 59.6 | Watt-s/ft.°F |
| Core Heat Capacity | 23.5 | Watt-s/m-°C | 4.0 | Watt-s/ft.°F |
| Encapsulation Thickness | 1.90 | mm | 0.07480 | in |
| Stranding Ratio | 1.0200 | | | |
| Covered Thickness | 0.000 | mm | 0.000 | in |
| Electrical Specifications | Metric | | Imperial | |
| DC Resistance at 20°C (Fully Annealed Al 63% IACS) | 0.2023 | ohm/km | 0.3255 | ohm/mile |
| DC Resistance at 25°C | 0.2064 | ohm/km | 0.3321 | ohm/mile |
| DC Resistance at 75°C | 0.2476 | ohm/km | 0.3985 | ohm/mile |
| Temperature Coefficient of Resistance at 20°C | 0.00408 | 1/°C | 0.00227 | 1/°F |
| Frequency | 60 | Hz | 60 | Hz |
| AC Resistance at 25°C | 0.2067 | ohm/km | 0.3327 | ohm/mile |
| AC Resistance at 75°C | 0.2479 | ohm/km | 0.3990 | ohm/mile |
| AC Resistance at 180°C | 0.3345 | ohm/km | 0.5383 | ohm/mile |
| Ampacity 4) | | 747 | @180°C, & A | |
| | | 785 | @200°C, & A | |
| GMR (estimated) | 5.79 | mm | 0.0190 | ft |
| Inductive Reactance (Xa: internal flux+external flux radius 1 ft) | 0.2989 | ohm/km | 0.481 | ohm/mile |
| Capacitive Reactance | 0.1791 | Mohm-km | 0.111 | Mohm-mile |

*TS Santanoni M3 4.5 (0.563) 271 conductor is produced with Fully Annealed Al aluminum. The nominal Aluminum equivalent area is 137.3 sq. mm (270.9 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 Santanoni M3 4.5 (0.563) 271 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.60 Hz, sea level (0) elevation, 30°N line Azimuth, noon on June 10th (96W/sq.ft, 1033W/sq.m), clear atmosphere

The information contained herein is offered in good faith. All values are nominal unless specifically indicated as maximum or minimum. The actual configuration of a given size may vary between conductor manufacturers and may result in slight variations in some of the indicated values. Data herein is to be considered confidential and proprietary to TS Conductor

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