

DATA SHEET:

TS Spruce M3 8.5 (0.858) 594



Governing Units: Metric

Mechanical Specifications	Metric		Imperial	
Fully Annealed Al Cross-sectional Area*	300.78	mm ²	593.59	kcmil
Encapsulated Aluminum Cross-Sectional Area	95.00	mm ²	0.14725	in ²
Diameter of Composite Core (Exclude Encapsulation)	8.5	mm	0.33500	in
Cross-sectional Area of Core (Exclude Encapsulation)	56.70	mm ²	0.08795	in ²
Overall Diameter of Conductor	21.793	mm	0.858	in
Cross-sectional Area of the Conductor (Exclude Covering)	357.50	mm ²	0.55417	in ²
Ultimate Tensile Strength of Conductor 1) ,2)	174.68	kN	39.27	kip
Rated Strength of Core - 399 ksi (2750 MPa)	156.00	kN	35.07	kip
Core Mass per unit length (Exclude Encapsulation)	99.00	kg/km	66.54	lb/kft
Conductor Mass per unit length	921.81	kg/km	619.54	lb/kft
Fully Annealed Al Mass per unit length (Include Encapsulation)**	822.81	kg/km	553.00	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)	15.526	x10 ⁻⁶ /°C	8.626	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)	71.4	GPa	10.4	Msi
Aluminum Heat Capacity	771.0	Watt-s/m-°C	130.6	Watt-s/ft-°F
Core Heat Capacity	83.9	Watt-s/m-°C	14.2	Watt-s/ft-°F
Encapsulation Thickness	2.70	mm	0.10630	in
Stranding Ratio	1.0215			
Covered Thickness	0.000	mm	0.000	in
Electrical Specifications	Metric		Imperial	
DC Resistance at 20°C (Fully Annealed Al 63% IACS)	0.0923	ohm/km	0.1486	ohm/mile
DC Resistance at 25°C	0.0942	ohm/km	0.1516	ohm/mile
DC Resistance at 75°C	0.1130	ohm/km	0.1819	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	0.0948	ohm/km	0.1526	ohm/mile
AC Resistance at 75°C	0.1136	ohm/km	0.1828	ohm/mile
AC Resistance at 180°C	0.1529	ohm/km	0.2461	ohm/mile
Ampacity 4)		1256	@180°C, & A	
		1323	@200°C, & A	
GMR (estimated)	8.99	mm	0.0295	ft
Inductive Reactance (Xa: internal flux+external flux radius 1 ft)	0.2656	ohm/km	0.428	ohm/mile
Capacitive Reactance	0.1590	Mohm-km	0.099	Mohm-mile

*TS Spruce M3 8.5 (0.858) 594 conductor is produced with Fully Annealed Al aluminum. The nominal Aluminum equivalent area is 300.8 sq. mm (593.6 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 Spruce M3 8.5 (0.858) 594 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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