

DATA SHEET:

604 KCMIL_AinAnoub_AECC_TW_M3_TS



Governing Units: Metric

Mechanical Specifications	Metric		Imperial	
Fully Annealed Al Cross-sectional Area*	306.22	mm ²	604.32	kcmil
Encapsulated Aluminum Cross-Sectional Area	86.58	mm ²	0.13420	in ²
Diameter of Composite Core (Exclude Encapsulation)	8.0	mm	0.31500	in
Cross-sectional Area of Core (Exclude Encapsulation)	50.30	mm ²	0.07791	in ²
Overall Diameter of Conductor	21.793	mm	0.858	in
Cross-sectional Area of the Conductor (Exclude Covering)	356.50	mm ²	0.55256	in ²
Ultimate Tensile Strength of Conductor 1) ,2)	157.07	kN	35.31	kip
Rated Strength of Core - 399 ksi (2750 MPa)	138.21	kN	31.07	kip
Core Mass per unit length (Exclude Encapsulation)	87.00	kg/km	58.47	lb/kft
Conductor Mass per unit length	926.18	kg/km	622.47	lb/kft
Fully Annealed Al Mass per unit length (Include Encapsulation)**	839.18	kg/km	564.00	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)	16.185	x10 ⁻⁶ /°C	8.992	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)	69.5	GPa	10.1	Msi
Aluminum Heat Capacity	785.0	Watt-s/m-°C	132.9	Watt-s/ft-°F
Core Heat Capacity	74.3	Watt-s/m-°C	12.6	Watt-s/ft-°F
Encapsulation Thickness	2.60	mm	0.10236	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)	0.0907	ohm/km	0.1460	ohm/mile
DC Resistance at 25°C	0.0926	ohm/km	0.1490	ohm/mile
DC Resistance at 75°C	0.1111	ohm/km	0.1788	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	0.0933	ohm/km	0.1501	ohm/mile
AC Resistance at 75°C	0.1117	ohm/km	0.1797	ohm/mile
AC Resistance at 180°C	0.1503	ohm/km	0.2419	ohm/mile
Ampacity 4)		1267	@180°C, & A	
		1334	@200°C, & A	
GMR (estimated)	8.94	mm	0.0293	ft
Inductive Reactance (Xa: internal flux+external flux radius 1 ft)	0.2661	ohm/km	0.428	ohm/mile
Capacitive Reactance	0.1590	Mohm-km	0.099	Mohm-mile

*604 KCMIL_AinAnoub_AECC_TW_M3_TS conductor is produced with Fully Annealed Al aluminum. The nominal Aluminum equivalent area is 306.2 sq. mm (604.3 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 604 KCMIL_AinAnoub_AECC_TW_M3_TS 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

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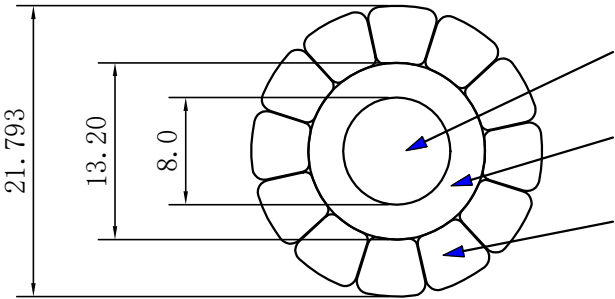
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ID:30682

Date Produced:

6/3/2025

TS Conductor Cross sectional drawing



Carbon fiber composite core :

Nominal diameter=8.0mm

Aluminium Encapsulation:

Thickness = 2.6mm Nominal area=86.58mm²

Trapezoidal shaped annealed aluminium wires:

Numbers=12 Nominal area=18.30 mm²

TS Conductor Corp.

TS Spruce M3 8.0 (0.858) 604 ID:30682

Design

Date

Check

Date

Ratify

Date

DATA SHEET:

TS Spruce M3 8 (21.793) IEC 604



Governing Units: Metric

Mechanical Specifications	Metric		Imperial	
Fully Annealed Al Cross-sectional Area*	306.22	mm ²	604.32	kcmil
Encapsulated Aluminum Cross-Sectional Area	86.58	mm ²	0.13420	in ²
Diameter of Composite Core (Exclude Encapsulation)	8.0	mm	0.31500	in
Cross-sectional Area of Core (Exclude Encapsulation)	50.30	mm ²	0.07791	in ²
Overall Diameter of Conductor	21.793	mm	0.858	in
Cross-sectional Area of the Conductor (Exclude Covering)	356.50	mm ²	0.55256	in ²
Ultimate Tensile Strength of Conductor 1) ,2)	157.07	kN	35.31	kip
Rated Strength of Core - 399 ksi (2750 MPa)	138.21	kN	31.07	kip
Core Mass per unit length (Exclude Encapsulation)	87.00	kg/km	58.47	lb/kft
Conductor Mass per unit length	926.18	kg/km	622.47	lb/kft
Fully Annealed Al Mass per unit length (Include Encapsulation)**	839.18	kg/km	564.00	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)	16.185	x10 ⁻⁶ /°C	8.992	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)	69.5	GPa	10.1	Msi
Aluminum Heat Capacity	785.0	Watt-s/m-°C	132.9	Watt-s/ft-°F
Core Heat Capacity	74.3	Watt-s/m-°C	12.6	Watt-s/ft-°F
Encapsulation Thickness	2.60	mm	0.10236	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)	0.0907	ohm/km	0.1460	ohm/mile
DC Resistance at 25°C	0.0926	ohm/km	0.1490	ohm/mile
DC Resistance at 75°C	0.1111	ohm/km	0.1788	ohm/mile
Temperature Coefficient of Resistance at 20°C	0.00408	1/°C	0.00227	1/°F
Frequency	50	Hz	50	Hz
AC Resistance at 25°C	0.0931	ohm/km	0.1498	ohm/mile
AC Resistance at 75°C	0.1115	ohm/km	0.1795	ohm/mile
AC Resistance at 180°C	0.1502	ohm/km	0.2417	ohm/mile
Ampacity 4)		1267	@180°C, & A	
		1334	@200°C, & A	
GMR (estimated)	8.94	mm	0.0293	ft
Inductive Reactance (Xa: internal flux+external flux radius 1 ft)	0.2218	ohm/km	0.357	ohm/mile
Capacitive Reactance	0.1908	Mohm-km	0.119	Mohm-mile

*TS Spruce M3 8 (21.793) IEC 604 conductor is produced with Fully Annealed Al aluminum. The nominal Aluminum equivalent area is 306.2 sq. mm (604.3 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 (21.793) IEC 604 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

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Date Produced: 3/28/2024

DATA SHEET:

TS Spruce M4 8 (21.793) IEC 604



Governing Units: Metric

Mechanical Specifications	Metric		Imperial	
Fully Annealed Al Cross-sectional Area*	306.22	mm ²	604.32	kcmil
Encapsulated Aluminum Cross-Sectional Area	86.58	mm ²	0.13420	in ²
Diameter of Composite Core (Exclude Encapsulation)	8.0	mm	0.31500	in
Cross-sectional Area of Core (Exclude Encapsulation)	50.30	mm ²	0.07791	in ²
Overall Diameter of Conductor	21.793	mm	0.858	in
Cross-sectional Area of the Conductor (Exclude Covering)	356.50	mm ²	0.55256	in ²
Ultimate Tensile Strength of Conductor 1) ,2)	174.68	kN	39.27	kip
Rated Strength of Core - 450 ksi (3100 MPa)	155.82	kN	35.03	kip
Core Mass per unit length (Exclude Encapsulation)	81.00	kg/km	54.44	lb/kft
Conductor Mass per unit length	920.18	kg/km	618.44	lb/kft
Fully Annealed Al Mass per unit length (Include Encapsulation)**	839.18	kg/km	564.00	lb/kft
Maximum Emergency Temperature at Surface 3)	200	°C	392	°F
Coefficient of Linear Expansion Above Thermal Kneepoint (core)	0.060	x10 ⁻⁶ /°C	0.033	x10 ⁻⁶ /°F
Coefficient of Linear Expansion Below Thermal Kneepoint (conductor)	15.580	x10 ⁻⁶ /°C	8.655	x10 ⁻⁶ /°F
Final Modulus of Elasticity Above Thermal Kneepoint (based on core area)	165.0	GPa	23.9	Msi
Final Modulus of Elasticity Below Thermal Kneepoint (based on conductor area)	71.7	GPa	10.4	Msi
Aluminum Heat Capacity	785.0	Watt-s/m-°C	132.9	Watt-s/ft-°F
Core Heat Capacity	68.8	Watt-s/m-°C	11.6	Watt-s/ft-°F
Encapsulation Thickness	2.60	mm	0.10236	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)	0.0907	ohm/km	0.1460	ohm/mile
DC Resistance at 25°C	0.0926	ohm/km	0.1490	ohm/mile
DC Resistance at 75°C	0.1111	ohm/km	0.1788	ohm/mile
Temperature Coefficient of Resistance at 20°C	0.00408	1/°C	0.00227	1/°F
Frequency	50	Hz	50	Hz
AC Resistance at 25°C	0.0931	ohm/km	0.1498	ohm/mile
AC Resistance at 75°C	0.1115	ohm/km	0.1795	ohm/mile
AC Resistance at 180°C	0.1502	ohm/km	0.2417	ohm/mile
Ampacity 4)		1267	@180°C, & A	
		1334	@200°C, & A	
GMR (estimated)	8.94	mm	0.0293	ft
Inductive Reactance (Xa: internal flux+external flux radius 1 ft)	0.2218	ohm/km	0.357	ohm/mile
Capacitive Reactance	0.1908	Mohm-km	0.119	Mohm-mile

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- 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 M4 8 (21.793) IEC 604 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

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