

## DATA SHEET:

## 459 KCMIL\_Marcy\_AECC\_TW\_M3\_TS



Governing Units: Metric

Mechanical Specifications	Metric		Imperial	
Fully Annealed Al Cross-sectional Area*	232.34	mm <sup>2</sup>	458.51	kcmil
Encapsulated Aluminum Cross-Sectional Area	63.59	mm <sup>2</sup>	0.09856	in <sup>2</sup>
Diameter of Composite Core (Exclude Encapsulation)	6.5	mm	0.25600	in
Cross-sectional Area of Core (Exclude Encapsulation)	33.20	mm <sup>2</sup>	0.05143	in <sup>2</sup>
Overall Diameter of Conductor	18.821	mm	0.741	in
Cross-sectional Area of the Conductor (Exclude Covering)	265.50	mm <sup>2</sup>	0.41156	in <sup>2</sup>
Ultimate Tensile Strength of Conductor 1) ,2)	105.60	kN	23.74	kip
Rated Strength of Core - 399 ksi (2750 MPa)	91.32	kN	20.53	kip
Core Mass per unit length (Exclude Encapsulation)	58.00	kg/km	38.98	lb/kft
Conductor Mass per unit length	693.34	kg/km	465.98	lb/kft
Fully Annealed Al Mass per unit length (Include Encapsulation)**	635.34	kg/km	427.00	lb/kft
Maximum Emergency Temperature at Surface 3)	200	°C	392	°F
Coefficient of Linear Expansion Above Thermal Kneepoint (core)	0.500	x10 <sup>-6</sup> /°C	0.278	x10 <sup>-6</sup> /°F
Coefficient of Linear Expansion Below Thermal Kneepoint (conductor)	16.825	x10 <sup>-6</sup> /°C	9.347	x10 <sup>-6</sup> /°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)	68.0	GPa	9.9	Msi
Aluminum Heat Capacity	595.6	Watt-s/m-°C	100.9	Watt-s/ft-°F
Core Heat Capacity	49.1	Watt-s/m-°C	8.3	Watt-s/ft-°F
Encapsulation Thickness	2.30	mm	0.09055	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)	0.1195	ohm/km	0.1923	ohm/mile
DC Resistance at 25°C	0.1219	ohm/km	0.1962	ohm/mile
DC Resistance at 75°C	0.1463	ohm/km	0.2355	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	0.1225	ohm/km	0.1971	ohm/mile
AC Resistance at 75°C	0.1468	ohm/km	0.2362	ohm/mile
AC Resistance at 180°C	0.1978	ohm/km	0.3183	ohm/mile
Ampacity 4)		1056	@180°C, & A	
		1111	@200°C, & A	
GMR (estimated)	7.68	mm	0.0252	ft
Inductive Reactance (Xa: internal flux+external flux radius 1 ft)	0.2776	ohm/km	0.447	ohm/mile
Capacitive Reactance	0.1660	Mohm-km	0.103	Mohm-mile

\*459 KCMIL\_Marcy\_AECC\_TW\_M3\_TS conductor is produced with Fully Annealed Al aluminum. The nominal Aluminum equivalent area is 232.3 sq. mm (458.5 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 459 KCMIL\_Marcy\_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

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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Date Produced:

6/3/2025