

TECHNICAL DATA SHEET


Epsilon Advanced Conductor 680 - 71

High Temperature Low Sag Conductors

EPSILON
CABLEInternational size **BUDAPEST**ASTM Size **FORT WORTH**

Governing Units: Metric to US Customary (Unit conversion)

STRANDING CONFIGURATION

	No. & Diameter of composite core	Metric		US Customary		
	Aluminum layers construction / Height	36 TW x	3.66	mm	0.144	in.
	1st layer composition and ϕ_{eq}	8 x	4.81	mm	0.189	in.
	2nd layer composition and ϕ_{eq}	12 x	4.87	mm	0.192	in.
	3st layer composition and ϕ_{eq}	16 x	4.90	mm	0.193	in.
	Lay Direction of outer layer	Right Hand (Z)				

CONDUCTOR PROPERTIES

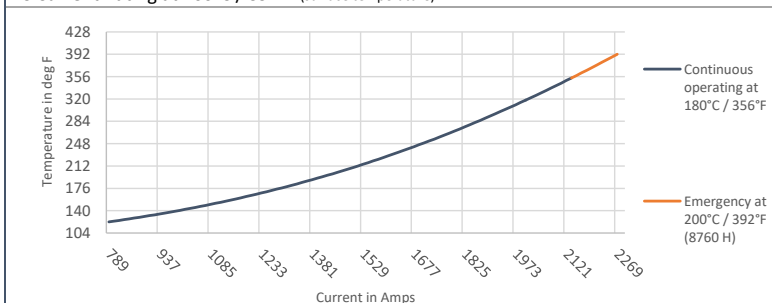
Cross Sectional Area - Annealed Aluminum (1350-O at 63%IACS)	670.2	mm ²	1322.7	kcmil
Cross Sectional Area - Composite Core	71.3	mm ²	0.1106	in. ²
Total Area of Conductor Cross Section	741.6	mm ²	1.1494	in. ²
Nominal equivalent Aluminum Area (1350-H19 at 61%IACS)	692.2	mm ²	1366.1	kcmil
Overall Diameter of Conductor	31.49	mm	1.240	in.
Mass per unit length - Annealed Aluminum	1,856.0	kg/km	1,247.2	lb/kft
Mass per unit length - Core	132.0	kg/km	88.7	lb/kft
Mass per unit length - Conductor	1,988.0	kg/km	1,335.8	lb/kft
Ultimate Tensile Strength of Conductor	200.3	kN	45.0	kips
Core Rated Tensile Strength	160.1	kN	36.0	kips
Coefficient of Linear Expansion Above Thermal Kneepoint	1.3	10 ⁻⁶ K ⁻¹	0.722	10 ⁻⁶ F ⁻¹
Coefficient of Linear Expansion Below Thermal Kneepoint	18.83	10 ⁻⁶ K ⁻¹	10.46	10 ⁻⁶ F ⁻¹
Final Modulus of Elasticity Above Thermal Kneepoint	123	GPa	17.84	Msi
Final Modulus of Elasticity Below Thermal Kneepoint	62	GPa	8.93	Msi

THERMAL SPECIFICATIONS

Maximum Continuous Operating Temperature ⁽²⁾ (surface temperature)	180	°C	356	°F
Maximum Emergency Temperature / 8760 Hours ⁽²⁾ (surface temperature)	200	°C	392	°F
Thermal Heat Capacity for Annealed Aluminum Layers	1,772.5	W-s/m-°C	300.0	W-s/ft-°F
Thermal Heat Capacity for Composite Core	105.6	W-s/m-°C	17.9	W-s/ft-°F

ELECTRICAL SPECIFICATIONS

Maximum DC Electrical Resistance at 20°C / 68°F (1370-O at 63%IACS)	0.0418	ohm/km	0.0673	ohm/mile
Temperature Coefficient of Resistance	4.07	10 ⁻³ K ⁻¹	2.109	10 ⁻³ F ⁻¹
AC Nominal Resistance at 25°C / 77°F (surface temperature)	0.0453	ohm/km	0.0729	ohm/mile
AC Nominal Resistance at 75°C / 167°F (surface temperature)	0.0534	ohm/km	0.0859	ohm/mile
AC Nominal Resistance at 180°C / 356°F (surface temperature)	0.0707	ohm/km	0.1138	ohm/mile
AC Nominal Resistance at 200°C / 392°F (surface temperature)	0.0740	ohm/km	0.1191	ohm/mile
AC Current Rating at 180°C / 356°F (surface temperature) ⁽¹⁾	2,144 A			
AC Current Rating at 200°C / 392°F (surface temperature) ⁽¹⁾	2,269 A			



Geometric Mean Radius (GMR)

12.72 mm 0.0417 ft.

Inductive Reactance $\phi 0.3m$ ($\phi 0.98ft$) radius0.2 $\Omega.km-1$ 0.3219 ohm/mileCapacitive Reactance $\phi 0.3m$ ($\phi 0.98ft$) radius0.17 M $\Omega.km$ 0.1056 Mohm-mile

(1) Ampacity calculations based on IEEE Standard 738-2012, according to the following data:

25 °C / 77 °F ambient temperature, 0.61 m/s (2 ft/s) wind velocity with an angle of 90 °,
 1000 W/m² (92.9 W/ft²) solar radiation, 0.5 solar absorption coefficient,
 0.6 emissivity coefficient, Resistance AC at 60 Hz current frequency.

(2) Temperatures defined according to ASTM B987-20.

Reference standards for core properties: ASTM B987-20.

Reference standards for electrical specifications: IEC 62219.

Reference standards for stranding parameters: ASTM B857-14/IEC 62219.

Rated specifications may slightly change depending on conductor manufacturer.

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contact@epsilon-cable.com
www.epsilon-cable.com