

## TECHNICAL DATA SHEET

## Epsilon Advanced Conductor 180 - 40

High Temperature Low Sag Conductors

EPSILON  
CABLEInternational size **ZADAR**

ASTM Size

-



Governing Units: Metric to US Customary (Unit conversion)

## STRANDING CONFIGURATION



No. &amp; Diameter of composite core

Metric

US Customary

Aluminum layers construction / Height

1st layer composition and  $\phi_{eq}$ 2nd layer composition and  $\phi_{eq}$ 

Lay Direction of outer layer

Right Hand (Z)

## CONDUCTOR PROPERTIES

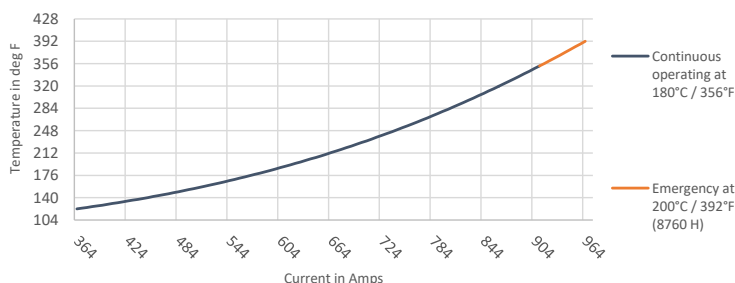
|                                                              |       |                                  |        |                                  |
|--------------------------------------------------------------|-------|----------------------------------|--------|----------------------------------|
| Cross Sectional Area - Annealed Aluminum (1350-O at 63%IACS) | 177.6 | mm <sup>2</sup>                  | 350.4  | kcmil                            |
| Cross Sectional Area - Composite Core                        | 39.7  | mm <sup>2</sup>                  | 0.0615 | in. <sup>2</sup>                 |
| Total Area of Conductor Cross Section                        | 217.3 | mm <sup>2</sup>                  | 0.3368 | in. <sup>2</sup>                 |
| Nominal equivalent Aluminum Area (1350-H19 at 61%IACS)       | 183.4 | mm <sup>2</sup>                  | 361.9  | kcmil                            |
| Overall Diameter of Conductor                                | 17.09 | mm                               | 0.673  | in.                              |
| Mass per unit length - Annealed Aluminum                     | 491.4 | kg/km                            | 330.2  | lb/kft                           |
| Mass per unit length - Core                                  | 73.5  | kg/km                            | 49.4   | lb/kft                           |
| Mass per unit length - Conductor                             | 564.9 | kg/km                            | 379.6  | lb/kft                           |
| Ultimate Tensile Strength of Conductor                       | 99.7  | kN                               | 22.4   | kips                             |
| Core Rated Tensile Strength                                  | 89.1  | kN                               | 20.0   | kips                             |
| Coefficient of Linear Expansion Above Thermal Kneepoint      | 1.3   | 10 <sup>-6</sup> K <sup>-1</sup> | 0.722  | 10 <sup>-6</sup> F <sup>-1</sup> |
| Coefficient of Linear Expansion Below Thermal Kneepoint      | 15.77 | 10 <sup>-6</sup> K <sup>-1</sup> | 8.76   | 10 <sup>-6</sup> F <sup>-1</sup> |
| Final Modulus of Elasticity Above Thermal Kneepoint          | 123   | GPa                              | 17.84  | Msi                              |
| Final Modulus of Elasticity Below Thermal Kneepoint          | 67    | GPa                              | 9.78   | Msi                              |

## THERMAL SPECIFICATIONS

|                                                                                 |       |          |      |           |
|---------------------------------------------------------------------------------|-------|----------|------|-----------|
| Maximum Continuous Operating Temperature <sup>(2)</sup> (surface temperature)   | 180   | °C       | 356  | °F        |
| Maximum Emergency Temperature / 8760 Hours <sup>(2)</sup> (surface temperature) | 200   | °C       | 392  | °F        |
| Thermal Heat Capacity for Annealed Aluminum Layers                              | 469.3 | W-s/m-°C | 79.4 | W-s/ft-°F |
| Thermal Heat Capacity for Composite Core                                        | 58.8  | W-s/m-°C | 9.9  | W-s/ft-°F |

## ELECTRICAL SPECIFICATIONS

|                                                                         |        |                                  |        |                                  |
|-------------------------------------------------------------------------|--------|----------------------------------|--------|----------------------------------|
| Maximum DC Electrical Resistance at 20°C / 68°F (1370-O at 63%IACS)     | 0.1578 | ohm/km                           | 0.2540 | ohm/mile                         |
| Temperature Coefficient of Resistance                                   | 4.07   | 10 <sup>-3</sup> K <sup>-1</sup> | 2.109  | 10 <sup>-3</sup> F <sup>-1</sup> |
| AC Nominal Resistance at 25°C / 77°F (surface temperature)              | 0.1617 | ohm/km                           | 0.2603 | ohm/mile                         |
| AC Nominal Resistance at 75°C / 167°F (surface temperature)             | 0.1937 | ohm/km                           | 0.3118 | ohm/mile                         |
| AC Nominal Resistance at 180°C / 356°F (surface temperature)            | 0.2610 | ohm/km                           | 0.4201 | ohm/mile                         |
| AC Nominal Resistance at 200°C / 392°F (surface temperature)            | 0.2738 | ohm/km                           | 0.4407 | ohm/mile                         |
| AC Current Rating at 180°C / 356°F (surface temperature) <sup>(1)</sup> | 915 A  |                                  |        |                                  |
| AC Current Rating at 200°C / 392°F (surface temperature) <sup>(1)</sup> | 964 A  |                                  |        |                                  |



Geometric Mean Radius (GMR)

7.10

mm

0.0233

ft.

Inductive Reactance  $\phi 0.3m$  ( $\phi 0.98ft$ ) radius

0.236

 $\Omega \cdot km^{-1}$ 

0.3798

ohm/mile

Capacitive Reactance  $\phi 0.3m$  ( $\phi 0.98ft$ ) radius

0.205

M $\Omega \cdot km$ 

0.1274

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/m<sup>2</sup> (92.9 W/ft<sup>2</sup>) 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.

Revision 01

Ref. Document ST21-00137

Date 12-Sep-2023

This document is the property of EPSILON COMPOSITE

[contact@epsilon-cable.com](mailto:contact@epsilon-cable.com)
[www.epsilon-cable.com](http://www.epsilon-cable.com)