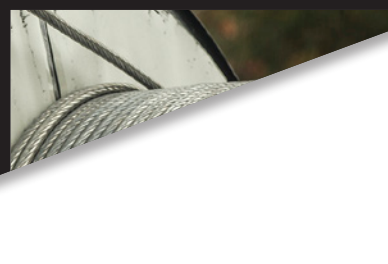
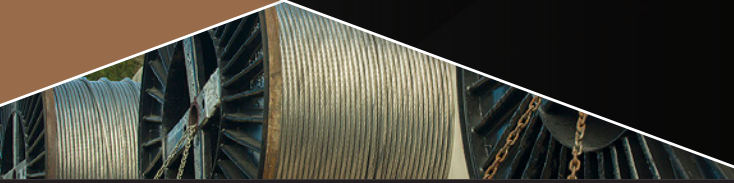




**Southwire®**

**C7<sup>®</sup> OVERHEAD  
CONDUCTOR  
BROCHURE**





# INNOVATION STARTS AT THE CORE

**Lighter, Stronger, Tougher.**

Southwire is revolutionizing the industry with its innovative C7<sup>®</sup> Overhead Conductor. With its unique stranded construction, Southwire's C7<sup>®</sup> Overhead Conductor is the most durable, rugged, and reliable composite core conductor on the market - and the only composite core conductor developed by a conductor manufacturer with full knowledge of utility needs and practices.





# INTRODUCING C<sup>7</sup><sup>®</sup> OVERHEAD CONDUCTOR

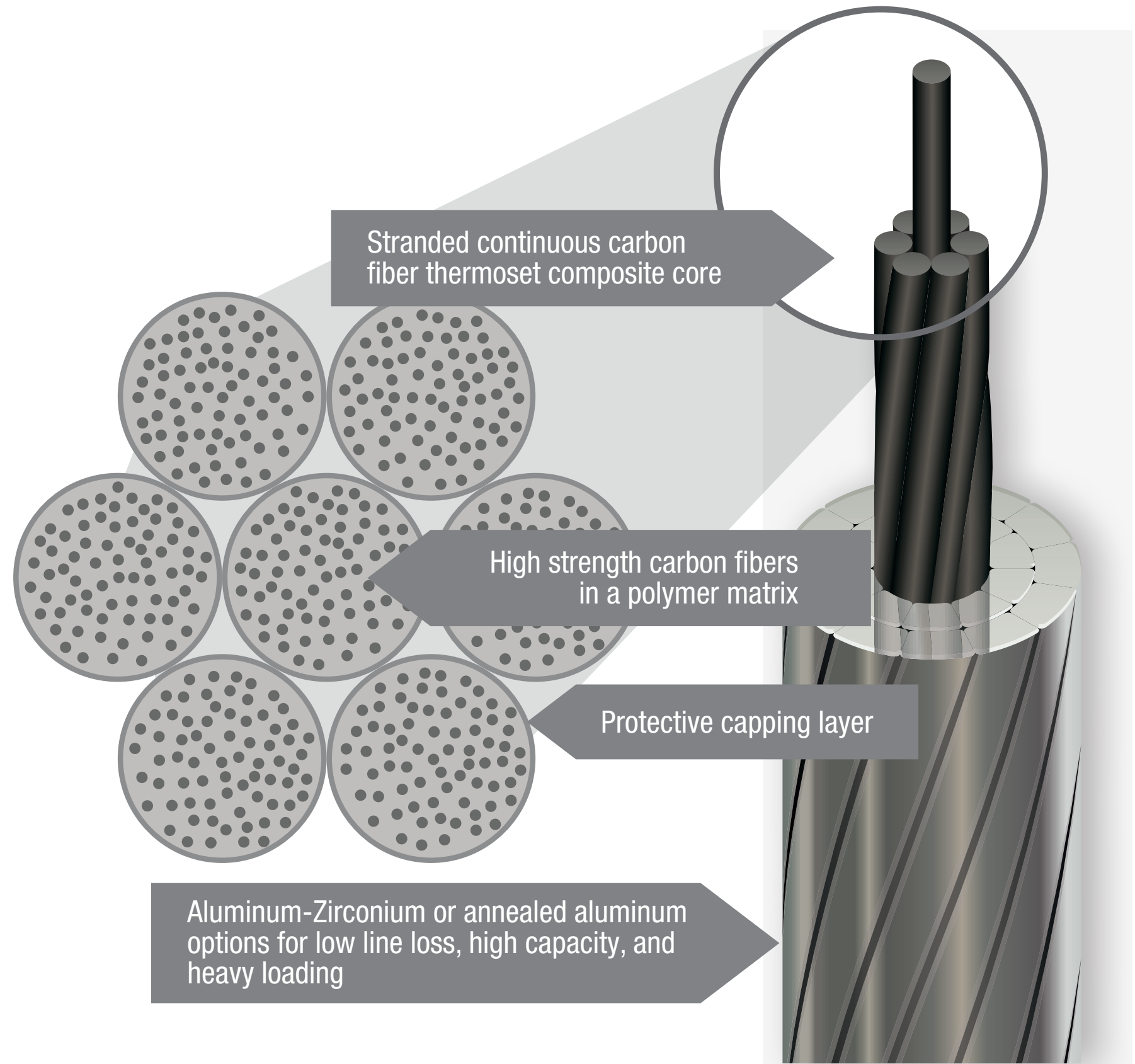
- **Minimal Thermal Expansion** – minimal sag increase at high power transfer
- **Stranded Core** – no single point of failure
- **Flexible** – robust, installs like traditional conductor
- **Less Sag** – for lines with clearance or structure limitations
- **Easy Installation** – uses traditional methods and familiar hardware
- **Designs For All Loading Conditions** – light loading to heavy ice loading
- **Trapezoidal Wire (TW) or Round Wire Available**
- **Aluminum-Zirconium (Al-Zr) or Annealed Aluminum (1350-0 Temper)**

#### New Lines:

Reduce new line costs by saving on structures and foundations. Cross challenging terrain or reduce the visual profile in sensitive areas. Build for the future with high capacity, low sag lines.

#### Reconductoring:

Double the capacity of existing ACSR lines. Light conductor weight and low sag allow use of existing structures and ROW, even for lines previously designed with all-aluminum or aluminum alloy (AAC, AAAC, ACAR) conductors.





# PERFORMANCE ADVANTAGES

## Proven Robust Materials

- Matrix materials have been used in demanding environments for over 50 years
- Resists harsh chemicals, high temperatures, and corrosion
- Resistant to abrasion and high-tension fatigue

## Low Sag

- Minimal sag increase at high temperature
- For lines with clearance or structure limitations
- Reduce land requirements, structure size and height, and foundation costs
- Overcome objections to high-visual-profile lines
- Capacity for future system rating increases without sag increase consideration

## Stranded Core

- Multi-strand, NO single-point of failure like single-rod designs
- More flexible than single-rod core designs
- Increased tolerance for bending

## Suitable for Extreme Weather Loading

- Al-Zr option bolsters carbon fiber to carry heavy ice and wind loads with low sag

## Increase Capacity

- Double the capacity of same-diameter ACSR round-wire conductor
- 180°C continuous, 200°C emergency ratings are material property based
- No losses due to core magnetization

## Conventional Installation & Inspection

- Uses standard work practices and traditional hardware
- Same stringing blocks and installation equipment as ACSS



# CASE STUDY: RECONDUCTORING

## C<sup>7</sup> Overhead Conductor Solves Erosion Issue:

A utility in the U.S. was planning to reconductor an existing 138 kV transmission line in a residential area to address encroaching erosion at a nearby river. To prevent issues related to river bank erosion near a structure, the utility was planning to move the structure further inland. The move would increase the river crossing span by approximately 550 feet, to 1,840 feet. The existing conductor was 795.0 kcmil 26/7 ACSR "Drake". The conductor solution was required to maintain existing clearances (design considerations limited sag to 40 feet) while also maintaining existing ampacity and tensions. The design considered NESC "Heavy" loading with an additional Extreme Ice/Wind load.

C<sup>7</sup> Overhead Conductor was pinpointed early on for its high-temperature, low-sag properties and its corrosion resistance. The proposed solution utilized a 7-strand carbon fiber thermoset core with trapezoidal-shaped annealed aluminum strands. Due to its high conductivity and high temperature rating, the C<sup>7</sup> overhead conductor solution, 477.0 kcmil Type 23 Capitol Reef/ACCS/TW/C7-TS, required 40% less aluminum to maintain the existing rating. The high strength of the carbon fiber composite core also allowed for a 16% smaller core to be used.

## Showing Up and Showing Out:

Using the C<sup>7</sup> overhead conductor solution, the sag in the 1,840-ft span decreased by 66% compared to the existing Drake. Conductor weight also decreased by 53%.

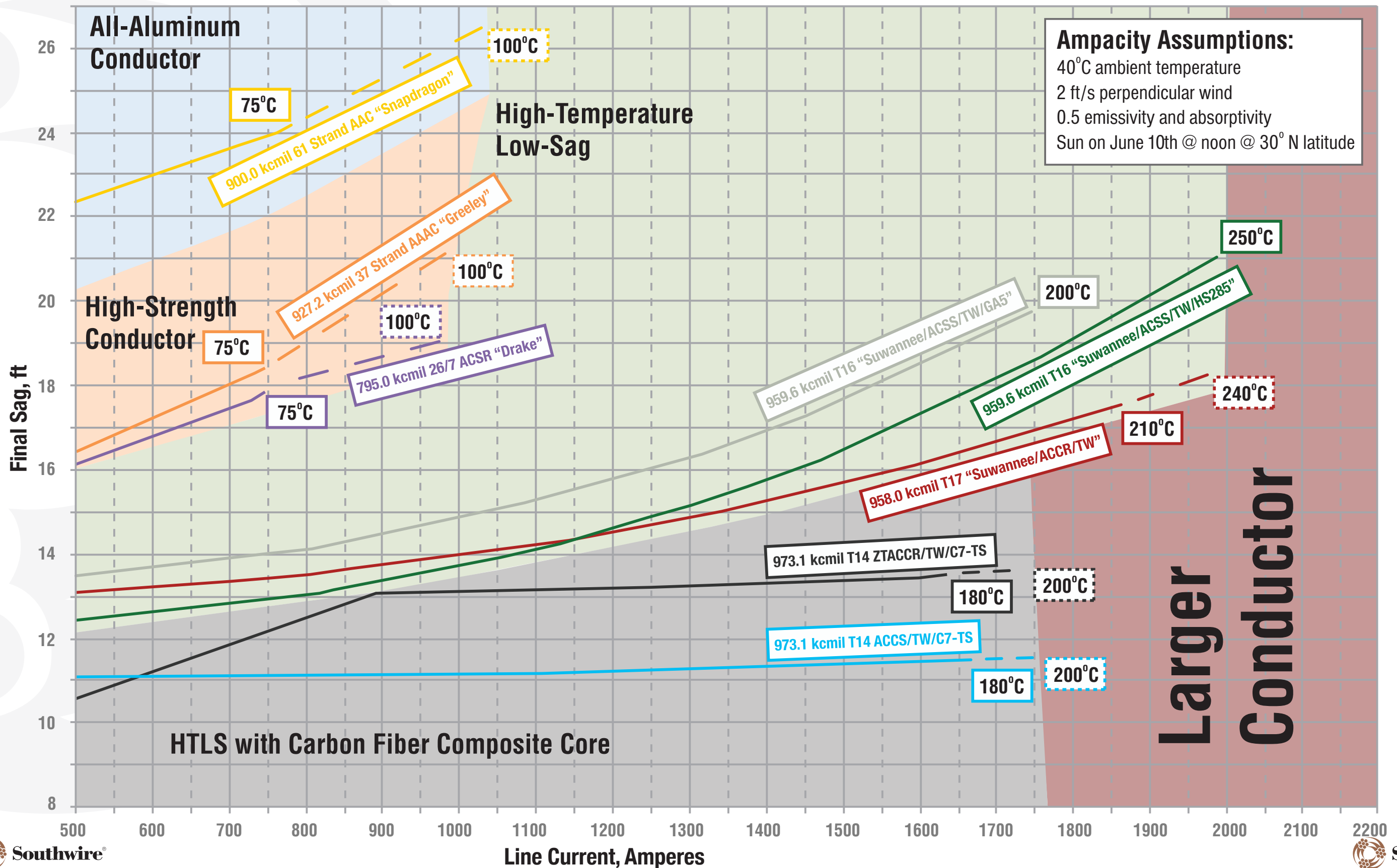
Conductor Type	Size kcmil	Stranding/ Type No.	Outside Diameter in	Weight lb/ft	RBS lb	Evaluation Results					
						Max Tension		Loaded Weight lb/ft	Cond. Temp. °C	Current A	Final Sag ft
						lb	%RBS				
ACSR*	795.0	26/7	1.108	1.093	31,500	12,480	40%	2.963	100	994	98.01
ACCS/TW/C7-TS	477.0	23	0.818	0.511	29,100	12,027	41%	2.128	180	1049	33.59

\*Sag-tension results assume movement of the structure and use of existing Drake



# COMPARING THE ALTERNATIVES

Conductor Performance Map, 1.108" OD, 800-ft RS, NESC "Medium", NESC Tension Limits











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