GUPTA POWER®
PRESENTS
RHINO SMART CONDUCTORS | CABLES WIRES | OFC | LED LIGHTING | EPC WIRE RODS | SOLAR

OUR PRODUCTS & SERVICES

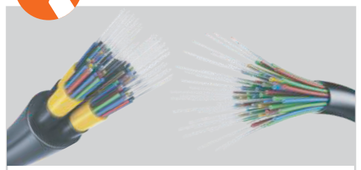
WIRES & CABLES

- Single Core Industrial Flexible Cables
- Multi Core Industrial Flexible Cables
- Co Axial TV Cables • Submersible Cables
- Telephone Switch Board Cables
- HT-LT Power Cables (66KV) • 1.1 KV LT XLPE
- PVC Power Cables • HT-LT Aerial Bunched Cables
- Instrumentation Cables • Control Cables
- Mining Cables • Thermocouple Cables
- Airfield Lighting Cables
- Railway Signalling Cables
- Other Specialised Cables
- Covered Conductors upto 33kV

LED LIGHTING

- Indoor Lighting
- Retail Lighting
- Warehouse Lighting
- Healthcare Lighting
- Outdoor Lighting
- Corporate Campus Lighting
- Facade Lighting
- Residential Lighting

OPTICAL FIBER



- Duct Cables
- Armored Cables
- Cables with Glass Roving
- ADSS Cables
- Aerial Cables
- Hybrid Cables
- CATV Cables
- FTTH Cables
- Indoor Cables

WIRES RODS

Aluminium and Alloy as per AA-
• 1XXX • 5XXX • 6XXX • 8XXX

SMART CONDUCTORS

- AAC / AAAC / ACSR / ACAR
- HTLS (STACIR / ACSS / TACSR)
- Composite Core Conductors

EPC DIVISION

- Survey • Design • Engineering
- Procurement • Construction
- Testing & Commissioning of Line & S/S Distribution & Transmission Class (LT, HT & EHT) both overhead and underground on Total Turnkey Basis.

CORPORATE OFFICE

Cuttack Road, Bhubaneswar - 751 006
Odisha, India
Phone: +91-674-2313898 / 2312945
Fax: +91-674-2312083
Email: info@guptapower.com,
rhino@guptapower.com

REGISTERED OFFICE

EN 62, 7th Floor,
Sector - V, Salt Lake City,
Kolkata - 700 091
Phone: +91-33-40657348
Email: kolkata@guptapower.com

RESEARCH & DEVELOPMENT CENTRE

Plot No. F/9, IDCO IID Centre,
Mukund Prasad,
Khordha - 752 054
Odisha, India
Email: info@guptapower.com

WORKS

ODISHA
Plot No. F/9, IID Centre Khurda - 752054

TAMIL NADU
Shed No. 13 & 18, Phase V, SIDCO Industrial Estate,
Gummidipoondi - 601 201

UTTARAKHAND
Plot No. 132, Nandanagar Industrial Estate,
Phase II, Vill Mahaukheraganj, Kashipur - 244 713

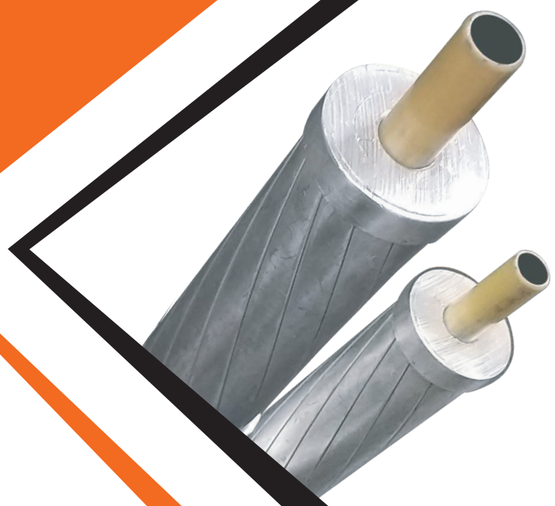
January 2020

www.guptapower.com

50 years of excellence

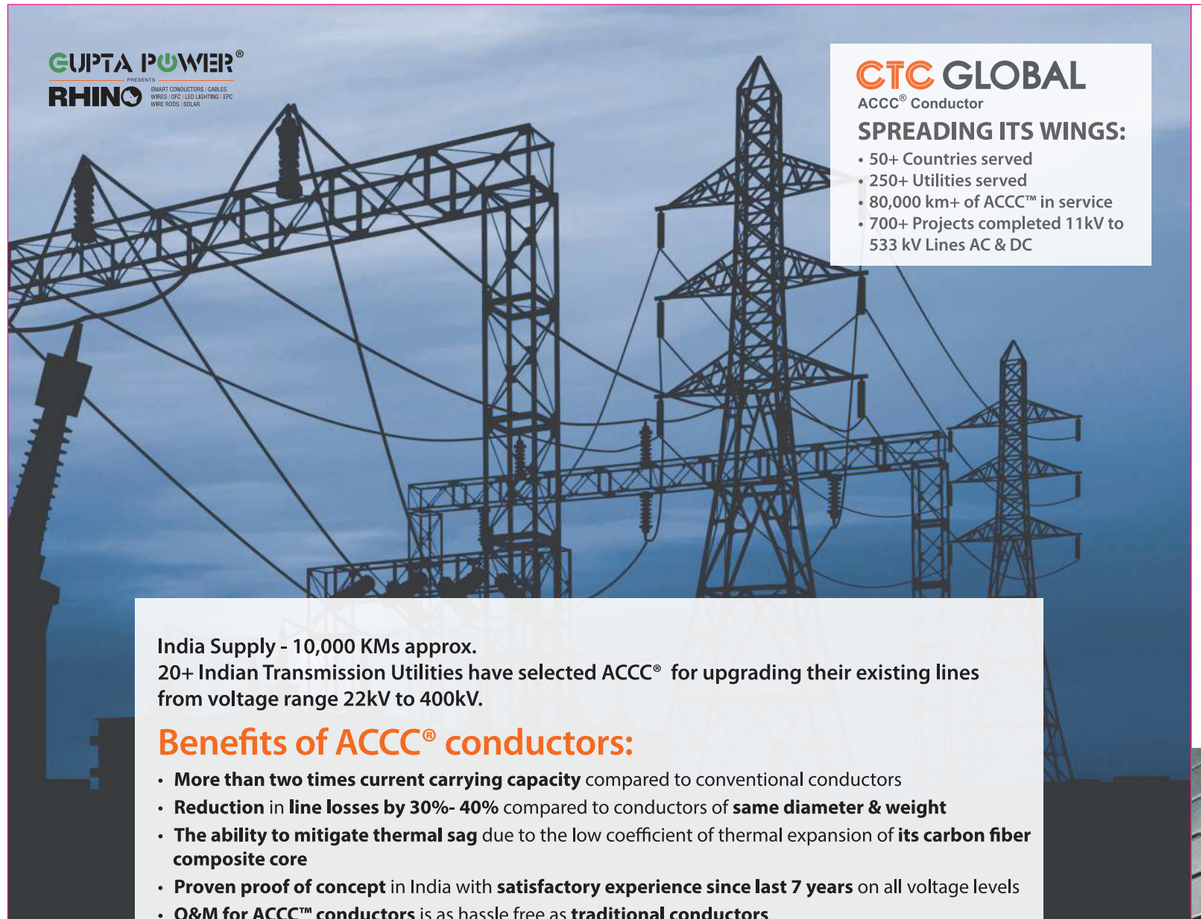
OVERHEAD SMART CONDUCTORS

Aluminium Conductor Composite Core (ACCC™)



GUPTA POWER®
PRESENTS
RHINO SMART CONDUCTORS | CABLES
WIRES | OFC | LED LIGHTING | EPC
WIRE RODS | SOLAR

Standards: BS, IEC, EN, ASTM, NF, VDE, ANSI, UL, KEMA & IS Standards with CE marking



GUPTA POWER® PRESENTS RHINO SMART CONDUCTORS | CABLES | WIRES | OFC | LED LIGHTING | EPC | WIRE RODS | SOLAR

CTC GLOBAL

ACCC® Conductor

SPREADING ITS WINGS:

- 50+ Countries served
- 250+ Utilities served
- 80,000 km+ of ACCC™ in service
- 700+ Projects completed 11kV to 533 kV Lines AC & DC

India Supply - 10,000 KMs approx.
20+ Indian Transmission Utilities have selected ACCC® for upgrading their existing lines from voltage range 22kV to 400kV.

Benefits of ACCC® conductors:

- **More than two times current carrying capacity** compared to conventional conductors
- **Reduction** in **line losses by 30%- 40%** compared to conductors of **same diameter & weight**
- **The ability to mitigate thermal sag** due to the low coefficient of thermal expansion of **its carbon fiber composite core**
- **Proven proof of concept** in India with **satisfactory experience since last 7 years** on all voltage levels
- **O&M for ACCC™ conductors** is as hassle free as **traditional conductors**

Accc® Conductor

Composition- Aerospace carbon fiber and boron free fiber glass composite conductor core

Advantages- Reduced Thermal Sag, reduced Line losses: Increased capacity, Greater Reliability

Accc® ULS Conductor

Composition- Standard ACCC core with an increased ratio of carbon fiber content

Advantages- Increase strength and stiffness to accommodate ultra-long spans between towers, improve ice load sags

Accc® AZR Conductor

Composition- Uses AlZr alloy that is thermally resistant, increasing tensile strength

Advantages- Significant reduction in ice load sag without increased installation tension

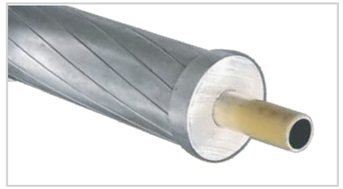
**Both Standard and ULS core types can be used in ACCC AZR*

GUPTA POWER® PRESENTS RHINO SMART CONDUCTORS | CABLES | WIRES | OFC | LED LIGHTING | EPC | WIRE RODS | SOLAR

CTC GLOBAL'S HIGH PERFORMANCE SMART CONDUCTORS FOR A LOW CARBON WORLD

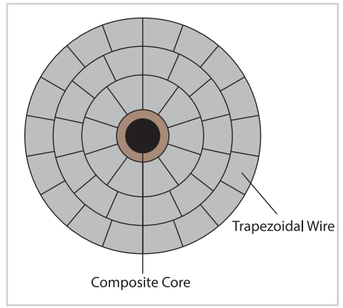
Aluminium Conductor Composite Core (ACCC™)

ACCC™ utilizes a hybrid carbon and glass fiber core embedded in a high-performance thermoset epoxy matrix. The central carbon fiber core consists of tens of thousands of high-strength, high-modulus unidirectional carbon fibers that are surrounded by a protective layer of glass fibers. The composite core is surrounded with Annealed Aluminium strands in close packed Trapezoidal configuration. Holistically the resultant is a Lighter conductor with high mechanical strength carrying twice the current.



ACCC™ is ideal for re-conductoring as:

- It Reduces cost of investment on new infrastructure by optimizing existing one
- It Improves Grid Reliability to Accommodate N-1 Emergency Condition
- It Increases Capacity of Existing Line to Accommodate Load Growth
- It Improves line efficiency & conserve generation resources



Properties	ACSR Moose	ACCC™ Mumbai	ACSR Zebra	ACCC™ Drake	ACSR Panther	ACCC™ Casablanca	ACSR Dog	ACCC™ Silvasa
Conductor Dia (mm)	31.77	**31.77**	28.62	**28.143**	21	**20.5**	14.15	**14.351**
Weight (kg/km)	2004	**1990**	1621	**1565**	974	**834**	394	**394**
DC Resistance @ 20°C (ohm/km)	0.05552	**0.0418**	0.06868	**0.0536**	0.1390	**0.1024**	0.2792	**0.2286**
Max. Operating Temperature (°C)	75	**180**	75	**180**	75	**180**	75	**180**
Current Carrying Capacity (A) at Max. Operating Temperature	735	**1940**	645	**1651**	430	**1083**	256	**650**
Sag @ Maximum Operating Temperature (m)	13.57	**10.79**	9.34	**8.4**	6.85	**5.65**	2.35	**1.42**
Ruling Span (m)	**400**		**320**		**304**		**150**	

Conditions considered:
1. 400 kV Line - ACSR Moose & ACCC™ Mumbai: Tension at every day condition (32°C, no wind) - Not exceeding 25% of UTS of proposed conductor, Wind Pressure - 218.6 kg/m^2 < 9908 kg & not exceeding 70% of UTS of proposed conductor
2. 220 kV Line - ACSR Zebra & ACCC™ Drake: Tension at every day condition (32°C, no wind) - Not exceeding 25% of UTS of proposed conductor, Tension at full wind (52 kg/m^2) < 4083 kg & not exceeding 50% of UTS of proposed conductor.
3. 132 kV Line - ACSR Panther & ACCC™ Casablanca: Tension at every day condition (32°C, no wind) - Not exceeding 25% of UTS of proposed conductor, Tension at 32°C, full wind (45 kg/m^2) < 2756 kg & not exceeding 50% of UTS of proposed conductor.
4. 33 kV Line - ACSR Dog & ACCC™ Silvassa: Tension at every day condition (32°C, no wind) < 2285 kg & Not exceeding 25% of UTS of proposed conductor, Tension at 32°C, full wind (52 kg/m^2) < 2571 kg & not exceeding 50% of UTS of proposed conductor.

Environmental Conditions assumed: Ambient Temperature 45 °C, Wind Speed 0.56 m/sec, Sun radiation 1045 Watt/m^2, Elevation 0 m, Solar absorbtivity 0.5 and Emissivity 0.5: The conditions are ideal case scenario, the detailed report can be shared with actual sag tension details.