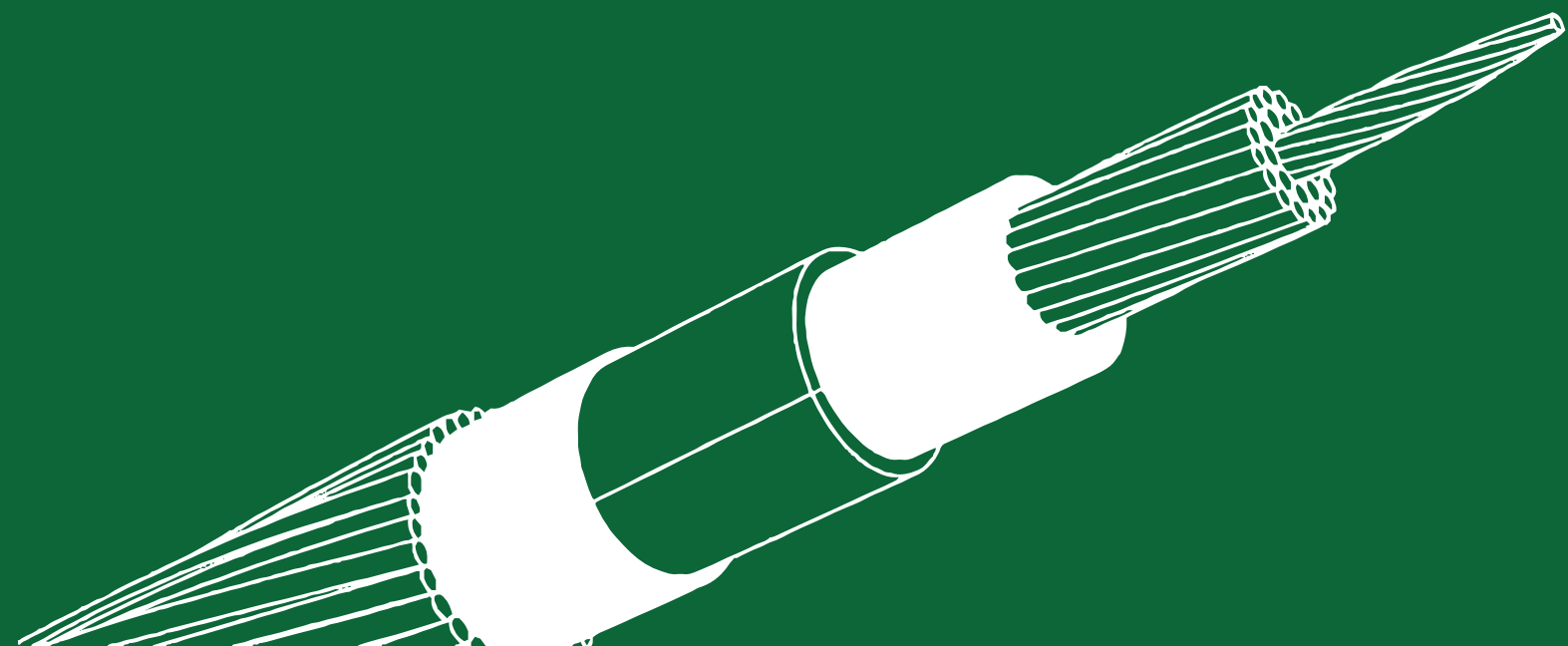


TIKA

C A B L E

**Power Transmission &
Distribution**



Description

Power transmission and distribution cables form the backbone of any electrical network, carrying electricity from generating stations to substations, and from substations to industrial facilities, commercial buildings, and residential areas.

This category includes overhead conductors (ACSR and AAAC) for primary transmission lines spanning long distances, as well as underground XLPE-insulated cables (11kV, 33kV, and 132kV) for urban and industrial distribution where space or aesthetics require buried installation.

These cables are designed to handle high voltages, extreme weather conditions, and demanding mechanical loads while maintaining reliable power delivery with minimal losses.

Typical applications:

National grid transmission lines

Urban underground power distribution

Industrial park primary feeders

Substation interconnections

Rural electrification projects

Specification

ACSR (Aluminium Conductor Steel Reinforced)

ACSR is a concentric-layered stranded conductor consisting of one or more layers of aluminium wires stranded over a high-strength steel core. The steel core provides excellent mechanical strength to support long spans and heavy ice or wind loads, while the aluminium strands carry the electrical current. ACSR is the preferred choice for overhead transmission lines, offering an optimal balance of strength, conductivity, and economy. It is widely used by utility companies across Southeast Asia for primary power transmission from generating stations to substations.

AAAC (All Aluminium Alloy Conductor)

AAAC is manufactured from aluminium-magnesium-silicon alloy wires, offering a superior strength-to-weight ratio compared to traditional aluminium conductors. Unlike ACSR, AAAC contains no steel core, making it entirely immune to galvanic corrosion — an important advantage in coastal and industrial environments. AAAC provides good electrical conductivity, excellent sag characteristics, and lower power losses. It is commonly used for overhead distribution lines, especially in coastal areas of Malaysia, Indonesia, and the Philippines where corrosion resistance is critical.

11kV / 33kV Underground Distribution Cable

These medium voltage power cables are designed for primary underground distribution networks. The cables feature a compact stranded copper or aluminium conductor, XLPE (cross-linked polyethylene) insulation for excellent thermal performance and dielectric strength, a bedding layer, steel wire armour (SWA) for mechanical protection against rodents and excavation, and an outer PVC or LSZH sheath. Rated for 11kV or 33kV operation, these cables are installed directly buried, in ducts, or on cable trays. They are the backbone of urban power distribution, feeding industrial parks, commercial centers, and residential developments from the primary substation.

132kV Transmission Cable

This high voltage underground cable is used for bulk power transmission between major substations or from transmission grid to large industrial complexes. The cable incorporates a segmented copper conductor, triple-extruded XLPE insulation, a copper wire screen for fault current return, a semi-conducting water-blocking layer, and a robust HDPE or PVC outer sheath. Designed to meet IEC 60840 standards, 132kV cables are typically installed in deep trenches, tunnels, or direct burial where overhead lines are impractical due to space or aesthetic constraints. These cables enable reliable high-capacity power transmission in densely built urban environments.



High Voltage Cable (132kV)



Aluminium Conductor Steel Reinforce(ACSR)



All Aluminium Alloy Conductor (AAAC)

Overhead Conductors

Parameter	ACSR	AAAC
Conductor	Aluminium strands over galvanized steel core	Aluminium-magnesium-silicon alloy (6201)
Stranding	Concentric lay, various combinations (e.g. 6/1, 26/7, 30/7, 54/7)	Concentric lay, all strands same alloy
Size Range	25/4 mm ² to 400/65 mm ² (or AWG equivalent)	25 mm ² to 400 mm ²
Strength	High (steel core provides mechanical strength)	Medium-high (good strength-to-weight ratio)
Conductivity	61% IACS (aluminium portion only)	52.5% IACS
Corrosion Resistance	Moderate (steel core can rust if damaged)	Excellent (no dissimilar metals)
Standards	IEC 61089, BS 215, ASTM B232	IEC 61089, BS 3242, ASTM B399
Typical Use	Long-span transmission, rural lines	Coastal areas, distribution lines

Underground Power Cables (11kV / 33kV / 132kV)

Parameter	11kV / 33kV Distribution Cable	132kV Transmission Cable
Voltage Rating (U₀/U)	6.35/11kV (12kV max) or 19/33kV (36kV max)	76/132kV (145kV max)
Conductor	Stranded copper (Class 2) or aluminium (Class 2), circular or shaped	Segmental copper (Class 2), water-blocking tapes
Conductor Screen	Semi-conducting XLPE bonded layer	Semi-conducting XLPE bonded layer
Insulation	XLPE (cross-linked polyethylene)	Triple-extruded XLPE (dry-cured)
Insulation Thickness	3.4mm (11kV), 5.5mm (33kV) typical	14mm – 18mm typical
Insulation Screen	Semi-conducting XLPE + copper tape or wire screen	Semi-conducting XLPE + copper wire screen + copper tape
Metallic Screen	Copper tape or copper wire (16mm ² – 50mm ²)	Copper wire screen (cross-section equal to conductor)
Bedding	PVC or PE (extruded)	Water-blocking semi-conducting swellable tapes
Armour	Steel wire armour (SWA), galvanized	None (or optional steel wire armour for mechanical protection)
Sheath	PVC (ST2) or LSZH (ST8)	HDPE or PVC (ST7 / ST8)
Bending Radius (installed)	12 × overall diameter (SWA)	15 × overall diameter
Max Conductor Temp (normal)	90°C	90°C
Max Conductor Temp (short circuit)	250°C (5 seconds)	250°C (3 seconds)
Standards	IEC 60502-2, MS 2116/2117/2118	IEC 60840, IEC 62067
Testing	Partial discharge <5pC at 2U ₀	Partial discharge <5pC at 2U ₀ , tan δ measurement

