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AMOKABEL COVERED CONDUCTOR

– FOR 11KV, 22KV & UP TO 52KV* (*ON REQUEST)

Reducing Bushfires & Outages

Increasing Safety Resilience and Reliability

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CABLE FOR LIFE

Amokabel's NGCC* Covered Conductors and accessories create a specifically engineered complete solution designed to:

- ✓ ***Reduce bush fire risk***
- ✓ ***Improve network resilience and reliability***
- ✓ ***Deliver cost-effective build/retrofit solutions***

The NGCC* system is a globally proven system, tested to all relevant international standards.

*NGCC - New Generation Covered Conductor

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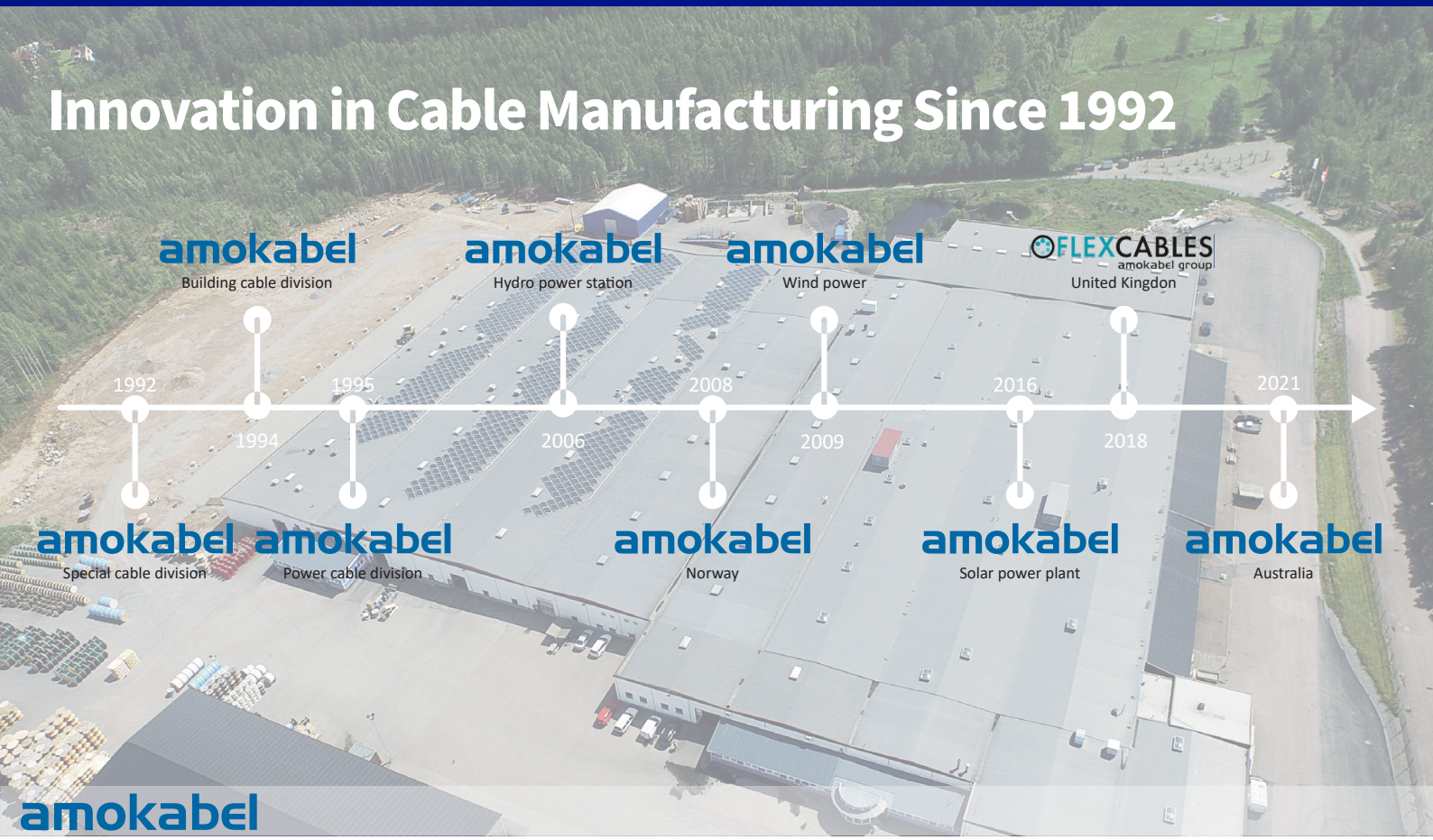
ISO 14001 CERTIFIED
CARBON CONSCIOUS COMPANY

ABOUT AMOKABEL



AMOKABEL POWER NETWORKS DIVISION

- Swedish company Amo kraftkabel AB is a world leading manufacturer of covered conductors for secure energy distribution. Our covered conductor systems span from 1 to 52kV. Our covered conductors are used in Europe, Africa, Australia, South America and Asia. Amo kraftkabel has also developed the ALUS-D, which is a double insulated 1kV ABC cable.
- Amokabel also provide a large range of AAC, AAAC and ACSR bare conductors from 40kV to 400kV.
- In addition, Amokabel has a full range of copper conductors for earthing, also including tinned copper and covered connecting cables. We specialize in providing customers with custom solutions for safe and cost-effective systems.
- Amokabel now has a subsidiary in Australia and is planning to commence production in Australia within the next twelve months to be able to meet the expected demand for covered conductor systems urgently needed by Australian networks.

AMOKABEL NGCC* SYSTEM

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WHY NEW GENERATION COVERED CONDUCTOR (NGCC) IS A STRONG FIT FOR NZ NETWORKS

- Storm & resilience focus: NZ outages are increasingly driven by extreme wind, rain, flooding and slips, making vegetation impacts and windborne debris the dominant risks. Covered conductor directly mitigates contact/ outage ignition while improving restoration safety and speed.
- Reliability & quality regulation: Commerce Commission quality standards (SAIDI/SAIFI) are front and centre; NGCC* reduces vegetation related faults and contributes to meeting DPP (Default Price-Quality Path) thresholds and disclosure expectations.
- Tree risk management trend: Government and industry are moving toward stronger vegetation controls (e.g., “clear to the sky” zones and expanded notice areas) covered conductor complements these changes by lowering residual risk where trees remain near lines.
- Safety for public, crews & wildlife: Typical leakage currents <1 mA reduces shock hazard for farm machinery, contractors, and the public; fully covered conductors significantly reduce wildlife electrocution risk important for native bird conservation and public perception.
- Bush/grass fire ignition reduction: While NZ’s “bushfire” risk is lower than the likes of Australia, NGCC* still addresses electrically initiated ignition from vegetation and animal contact (up to ~99% reduction vs. bare, based on CSIRO).

NZ STANDARDS, CODES & COMPLIANCE ALIGNMENT

- Design & construction: NGCC* system approach aligns with AS/NZS 7000 Overhead line design and the guidance in SA/SNZ HB 331:2020 Overhead line design handbook, which NZ utilities already reference for distribution (11 kV, & 22 kV).
- Electrical safety legislation: Installation and operation comply with Electricity (Safety) Regulations 2010, including safe distances and signage; NZECP 34 safe distance obligations remain for builders and mobile plant.
- SWER compatibility: NGCC* Hybrid is well suited to rural SWER contexts common in NZ.

SYSTEM APPROACH & INSTALLATION

- Fast retrofit with familiar practices: Stringing NGCC* is near identical to bare conductor methods; crews use the same trailers, recovery units, rollers, and strain gear minimising retraining time.
- Cost & programme advantages: Restringing NGCC* is typically only 10–15% more than bare; undergrounding alternatives are up to ten times more expensive and NGCC* delivers a large risk reduction step without capex shock.

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AMOKABEL NGCC* SYSTEM

- Span & structure: Use of ACSR/ACS options supports long spans and often eliminates interpoling, ideal where NZ terrain, access and forestry corridors make pole additions costly.
- Lifecycle: Minimum expected service life of at least 45 years, comparable to bare conductor.
- Accessories & training: Full suite of tested accessories plus local project support and crew training.

TECHNICAL HIGHLIGHTS MOST RELEVANT TO NZ DISTRIBUTION

- Voltage platforms: NGCC* Hybrid as a 22 kV MV option; NZ distribution commonly at 11 kV & 22 kV.
- Conductor choices in AU (indicative for NZ feeders):
  - o 25 mm^2 ACSC (SWER, long rural spans)
  - o 62 mm^2 ACSR
  - o 159 mm^2 AAAC

  These map well to rural NZ feeder typologies where span length and sag control are key. A full range of cable sizes is available in addition to these three standard sizes.
- Materials & layers: Longitudinal water blocking, inner semicon layer, XLPE insulation, and UV resistant HDPE outer jacket, durable under NZ's UV, salt spray and high rainfall exposures.
- Amokabel NGCC* can be used as a direct alternative to AAC without interpoling.

RELIABILITY CASE FRAMING FOR NZ EXECUTIVES & REGULATORS

- Vegetation is a leading outage driver in NZ; utilities and Transpower are investing in vegetation intelligence and LiDAR to mitigate risk – NGCC* reduces consequence when contact occurs and complements data driven vegetation programmes.
- Major event context: Gabrielle caused ~234k customer outages; regulators emphasised resilience planning as the "new normal", NGCC* is a practical, network wide mitigation that supports resilience objectives without waiting on undergrounding budgets.
- Disclosure readiness: With evolving Commerce Commission definitions and assurance, demonstrating fault reduction from NGCC* helps show progress against reliability metrics (SAIDI/SAIFI) and supports price quality compliance narratives.

KEY SUMMARY

"NGCC* covered conductor delivers underground like reliability at a fraction of the cost, materially reduces vegetation/animal fault risk, improves public and crew safety, and aligns with NZ standards and evolving vegetation regulations making it a pragmatic resilience investment for 11 & 22kV feeders across rural and urban New Zealand."

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CCSX25 11/22kV W Hybrid

CCSX25 **7/2.12 ACS** (Aluminium Clad Steel) **CBL 31.5kN** (Breaking Load)

Direct replacement for 3/2.75 (3/12) steel conductor

- Conductor and all layers simultaneously manufactured in one operation
- Extruded, longitudinal water blocking layer
- Extruded, inner semi-conductive layer
- XLPE Insulation layer
- UV-/Track resistant HDPE outer layer
- Tested to AS/NZ and EN50397-1 standards

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CAT No.		CCSX25
Cross Section	mm^2	25
Conductor Type		ACS
Lay up of Conductor		7x2.12
Conductor Diameter, Bare Conductor nom	mm	6.36
Inner Semi-Conductive Layer, Thickness, nom	mm	0.3
Inner XLPE Covering, Thickness, nom	mm	1.32
Outer UV-Resistance HDPE Covering, Thickness, nom	mm	1.1
Diameter Over Covering, Min-Max	mm	11.8
Weight, nom	kg/km	247
Rated Operating Voltage U	kV	22
DC-Resistance at 20°C, Max	ohm/km	3.500
DC-Resistance at 80°, Max	ohm/km	4.340
Resistance Temperature, Coefficient	/°C	0.004
Operating Temperature, Max	°C	80(1)
Max Load(IEC 61597), Cond.Temp 80 °C, Air Temp. 30°C, Wind Speed 0.5 m/s, Solar Radiation 1045W/m^2, α=0.9, ε=0.15 Approx Value	A	Contact us for calculation
Max Short Circuit Current, 1 sec 80-250°C	kA	1.0
Tensile Strength of Conductor, Min	kN	31.5
Aluminium Alloy		ACS
Colour		Grey
Linear Expansion Coefficient	°C	$13x10^{-6}$
Final Modulus of Elasticity	GPa	159

CCSX62 11/22kV W Hybrid

CCSX62 **6/1/3.37 ACSR** (Aluminium Conductor Steel Reinforced) **CBL 18.6kN** (Breaking Load)

Direct replacement for AAC and ACSR conductors from 7/2.50 to 7/3.75

- Conductor and all layers simultaneously manufactured in one operation
- Various conductor types
- Extruded, longitudinal water blocking layer
- Extruded, inner semi-conductive layer
- XLPE Insulation layer
- UV-/Track resistant HDPE outer layer
- Tested to AS/NZ and EN50397-1 standards

CAT No.		CCSX62
Cross Section	mm^2	62
Conductor Type		ACSR
Lay up of Conductor		(6+1)x3.37
Conductor Diameter, Bare Conductor nom	mm	10.11
Inner Semi-Conductive Layer, Thickness, nom	mm	0.3
Inner XLPE Covering, Thickness, nom	mm	1.32
Outer UV-Resistance HDPE Covering, Thickness, nom	mm	1.1
Diameter Over Covering, Min-Max	mm	14.7-16.8
Weight, nom	kg/km	340
Rated Operating Voltage U	kV	22
DC-Resistance at 20°C, Max	ohm/km	0.5355
Resistance Temperature, Coefficient	/°C	0.004
Operating Temperature, Max	°C	80
Max Load(IEC 61597), Cond.Temp 80 °C, Ambient Temp. 15°C, Wind Speed 0,5 m/s, Solar Radiation 1000W/m^2, α=0,9, ε=0,15 Approx Value	A	252
Max Load(IEC 61597), Cond.Temp 80 °C, Ambient Temp. 40°C, Wind Speed 0,5 m/s, Solar Radiation 1000W/m^2, α=0,9, ε=0,15 Approx Value	A	180
Max Short Circuit Current, 1 sec 80-250°C	kA	4.9
Tensile Strength of Conductor, Min	kN	18.6
Aluminium Alloy		AL1/ST1A
Colour		Grey
Linear Expansion Coefficient	°C	$19x10^{-6}$
Permissable Elongation, Creep	%	0.03
Module of Elasticity After Load (Estimated Value)	GPa	80
Frequency	Hz	50
Operating Temperature Range	°C	-40 to +80
Minimum Bending Radius During Installation	mm	15xD
Minimum Bending Radius Set In Position	mm	10xD

CCSX159 11/22kV W Hybrid

CCSX159 **19/3.26 AAAC** (All Aluminium Alloy) **CBL 42kN** (Breaking Load)

Direct replacement for 19/3.25 AAC

- Conductor and all layers simultaneously manufactured in one operation
- Various conductor types
- Extruded, longitudinal water blocking layer
- Extruded, inner semi-conductive layer
- XLPE Insulation layer
- UV-/Track resistant HDPE outer layer
- Tested to AS/NZ and EN50397-1 standards

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CAT No.		CCSX159
Cross Section	mm^2	159
Conductor Type		AAAC
Lay up of Conductor		19x3.26
Conductor Diameter, Bare Conductor nom	mm	16.3
Inner Semi-Conductive Layer, Thickness, nom	mm	0.3
Inner XLPE Covering, Thickness, nom	mm	1.32
Outer UV-Resistance HDPE Covering, Thickness, nom	mm	1.1
Diameter Over Covering, Min-Max	mm	20.9-23.0
Weight, nom	kg/km	642
Rated Operating Voltage U	kV	22
DC-Resistance at 20°C, Max	ohm/km	0.192
Resistance Temperature, Coefficient	/°C	0.004
Operating Temperature, Max	°C	80
Max Load(IEC 61597), Cond.Temp 80 °C, Ambient Temp. 15°C, Wind Speed 0,5 m/s, Solar Radiation 1000W/m^2, α=0,9, ε=0,15 Approx Value	A	472
Max Load(IEC 61597), Cond.Temp 80 °C, Ambient Temp. 40°C, Wind Speed 0,5 m/s, Solar Radiation 1000W/m^2, α=0,9, ε=0,15 Approx Value	A	329
Max Short Circuit Current, 1 sec 80-250°C	kA	16.0
Tensile Strength of Conductor, Min	kN	42.0
Aluminium Alloy		AL7
Colour		Grey
Linear Expansion Coefficient	°C	$23x10^{-6}$
Permissable Elongation, Creep	%	0.04
Module of Elasticity After Load (Estimated Value)	GPa	64
Frequency	Hz	50
Operating Temperature Range	°C	-40 to +80
Minimum Bending Radius During Installation	mm	15xD
Minimum Bending Radius Set In Position	mm	10xD

ACCESSORIES

UNIVERSAL FITTINGS FOR ALL NGCC* SIZES

IPC Covered to Covered	IPC Covered to Bare	IPC with Covered Stirrup
		
SLW26A	SLW34A	SLW26A2 - *Item doubles as LLC connection or earthing point*
LA Connector	**Angle Clamp**	**Angle Clamp Cover**
		
SLIW65S - *Inserts into CC to CC IPC*	SO181.6S	SP62.3

CCSX25 FITTINGS

Compression Dead End (CDE)	CDE Cold Shrink Cover	25 Ties
		
CDE 7/2.12	STE25	SP62.3
Mid Span Joint	**Mid Span Cold Shrink Cover**	**Cold Shrink Cap**
		
MSJ 7/2.12	STE26	CSEC1.1 - *Same for 25 & 62*

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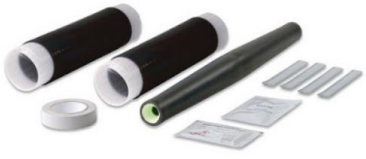
ACCESSORIES

CCSX62 FITTINGS

Termination Clamp	Termination Clamp Cover	62 Ties
		
SO255.2S	SP63.3	SO216.62
Cold Shrink Cap	**Autosplice**	
		
CSEC1.1 - *Same for 62 & 25*	CIL107	

CCSX159 FITTINGS

Termination Clamp	Termination Clamp Cover	159 Ties
		
SO256.2S	SP67.3	SO216.157
Cold Shrink Cap	**Autosplice**	
		
CSEC1.2	CIL109	

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INSTALLATION

INSTALLATION REQUIREMENTS

Overview

Installation requirements and works practices for NGCC* are almost identical to that of stringing bare conductor.

Typical equipment such as a recovery unit, cable trailer with an effective braking system, suitable rollers and appropriately rated hauling and straining equipment are also required to haul, string and strain Amokabel NGCC*.

General Principles

When stringing NGCC*, it is preferred to keep the NGCC* off the ground where possible and practical. Steps should be taken to prevent potential damage to the NGCC* hard covering from sharp objects such as barbed wire fences, street signs or farm implements. Steps to mitigate damage include placing barriers to prevent contact.

Specific stockings and comealongs are required for each of the 3 sizes of covered conductor with each size having its own specific termination fitting type.

OVERVOLTAGE PROTECTION

Overvoltage protection is recommended in lightning prone areas and near frequently used areas. Each DB is responsible to determine the frequency and location of surge protection. Contact us directly for further information.

VIBRATION PROTECTION

Each DB is responsible to determine where vibration protection is required to be fitted considering the topography, span lengths and tension.

Scan the QR code for more on the Amokabel NGCC* system

NOTES

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