



VIRTUAL AMEU BRANCH MEETING

Introduction to CBI-electric: african cables

Presented by: Shaun Reinecke (Manager: Strategic Accounts)

9 December 2021



Power by Innovation... Innovation Through Partnerships

- Founded in 1935 in Vereeniging, South Africa
- 1st company in the SA cable Industry to simultaneously obtain accreditation for:
 - ISO 9001:2015
 - ISO 14001:2015
 - ISO 45001:2018 (Note – replaces ISO 18001)
- B-BBEE Level 1 in terms of the new codes
 - 56.75% Black Ownership
 - 42.75% Black Woman Ownership
- Just over 562 employees
- Power Installation offices in
 - Gauteng,
 - Cape Town
 - Durban

Form COR-05/AP/R24

EMPOWERDEX
Economic Empowerment Rating Agency

Generic B-BBEE Verification Certificate

ATC (Pty) Ltd
t/a CBI-Electrical African Cables
Including Tank Industries and Power Installations

Registration Number: 1955/003773/07
Address: 1 Steel Road, Peacehaven, Vereeniging, 1939

Level One Contributor

Scorecard Information	Actual Score	Target Score	Analysis	Results
Ownership	25.00	25.00	Black Ownership Percentage	56.75%
Management Control	9.21	19.00	Black Women Ownership Percentage	42.75%
Skills Development	20.89	20.00	Black Designated Group Percentage	11.47%
Enterprise and Supplier Development	40.84	42.00	Black Disabled Percentage	0.00%
Socio-Economic Development	9.69	8.00	Black Youth Percentage	11.47%
Total Score	101.04	119.00	Black Unemployment Percentage	0.00%
			Black People Living In Rural Areas	0.00%
Participated in Y.E.S Initiative	No		Black Military Veterans	0.00%
Achieved Y.E.S Target & 2.5% Absorption	N/A		Modified Flow Through Applied	No
Achieved 1.5 x Y.E.S Target & 5% Absorption	N/A		Exclusion Principal Applied	No
Achieved 2 x Y.E.S Target & 8% Absorption	N/A		VAT Number	478021889
Empowering Supplier	Yes		Financial Year End	30/09/2021
Procurement Recognition Level	133.00%		Effective Date Used	09 November 2021
Discounting Principle Application	No		Expiry Date	04 November 2022
Recorded Procurement Recognition Level	133.00%		Re-issue Date	N/A

Technical Signature: L Ndumase
Date: 5/11/2021

This verification certificate and the verification report are based on information provided to Empowerdex and represent an independent opinion based on the verification and analysis compiled by Empowerdex. The calculation of the scores has been determined in accordance with the Department of Trade and Industry's Codes of Good Practice on Broad Based Black Economic Empowerment as gazetted on 31 May 2019.

Empowerdex Northern Regions (Pty) Ltd Reg. 2008/004631/07
Directors: J Brednor, R O'Brien, L Ratsoma

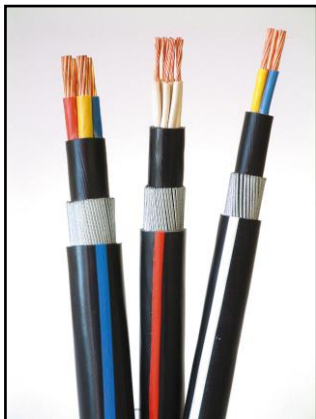
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B-BBEE Verification Agency
BVA 101

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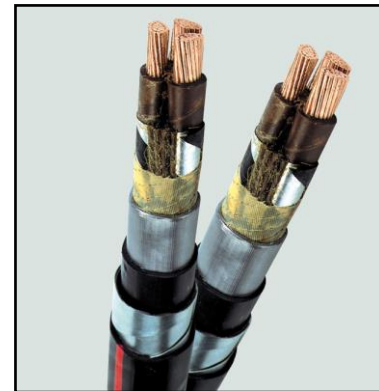
Certificate





Low, Medium & High Voltage Cable

(Government has mandated that all underground electric cables should have a Local Content minimum % of 90% – made in South Africa by South Africans)





Three basic criteria for cable selection

Cable current rating

Focus is on cables' ability to dissipate heat

- Standard conditions
- Non standard conditions



Volt drop

Very important in long LV installations (50m and above)

- Theory



Fault carrying capability of the cable

High Voltage XLPE Cables

XLPE
W/B, CSA, PE

F2PC...
...068

Primary group code
Finish code

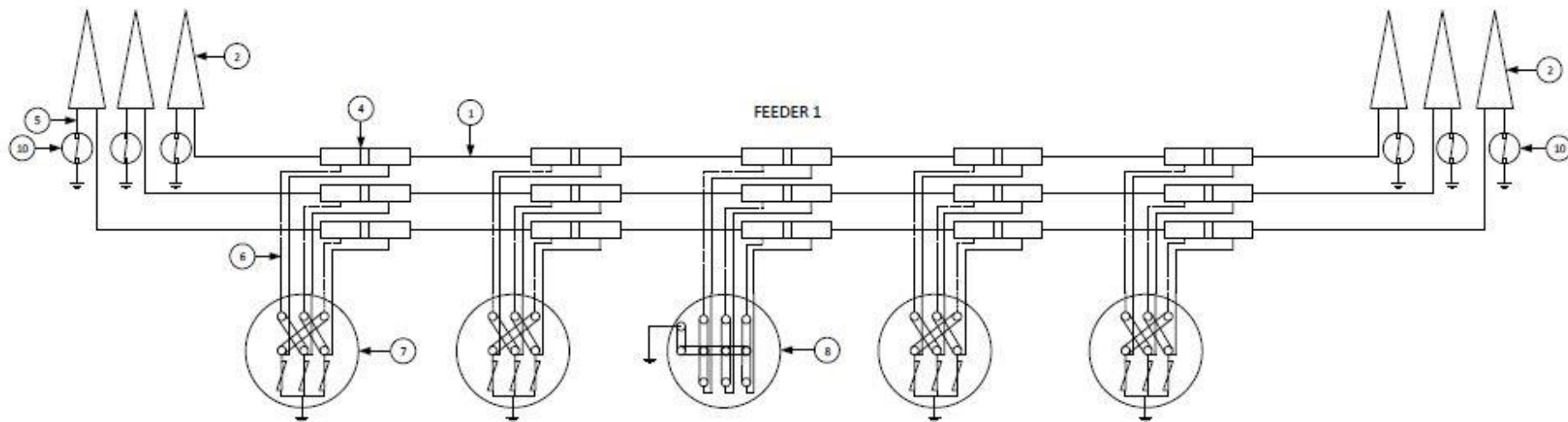
Copper 1 Core
76000/132000V
AFCAB SPEC

Single Point /Cross Bonded Cable Systems

Size Code	Units	1300	1400	1500	1630	1800	1999
Physical Dimensions:							
Conductor size	mm ² nom	300	400	500	630	800	1000
Conductor Diameter	mm app.	21.0	24.5	27.5	30.5	34.5	39.0
Insulation Diameter	mm app.	70.5	70.0	71.0	73.5	78.0	83.5
Outer S/C Screen Diameter	mm app.	74.0	73.5	74.5	76.5	81.0	86.6
CSA Diameter	mm app.	94.0	93.5	94.5	96.5	101.5	107.0
Cable Diameter (D)	mm app.	103.0	102.5	103.0	106.5	111.5	117.5
Cable Mass	kg/m app.	10.74	11.25	12.23	13.78	15.99	18.56
Gross Mass (500 m)	kg app.	6360	6619	7109	7883	8987	10274
Current Ratings:							
Flat Formation @ (2xD)							
In ground	Amps	570	648	735	829	925	1017
In air	Amps	817	956	1110	1276	1450	1626
Trefoil Formation							
In ground	Amps	539	608	683	761	836	904
In air	Amps	731	844	967	1096	1228	1354
Electrical Parameters:							
AC Resistance @ 90°C	Ω/km max	0.078	0.062	0.049	0.039	0.032	0.026
Capacitance	μF/km	0.143	0.158	0.176	0.187	0.199	0.212
Reactance (Flat)	Ω/km	0.202	0.193	0.201	0.196	0.192	0.187



So what does an HV cable installation design look like?





New Developments



- We offer:
 - Cable Collector System Design
 - Manufacture and Supply
 - Installation
 - Testing
- Cable Features:
 - Superior water blocking performance including conductor
 - Light weight and long lengths
 - SABS type test approval to SANS 1339
 - SABS short circuit tested to SANS 62271





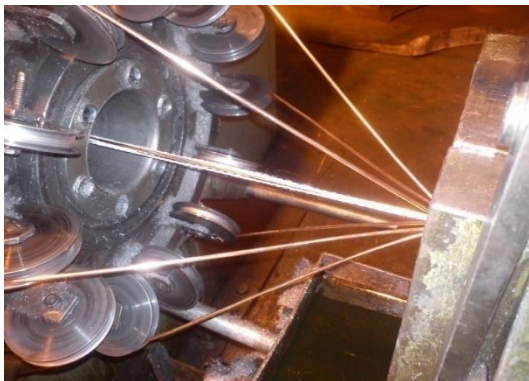


1



Water blocking strings
enter strand at start

2



Water blocking strings
enclosed under first copper
layer

3



Water blocking tape
wrapped over

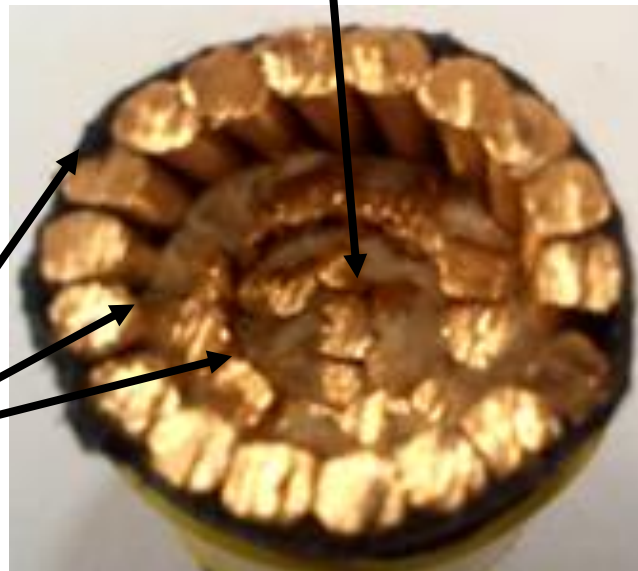
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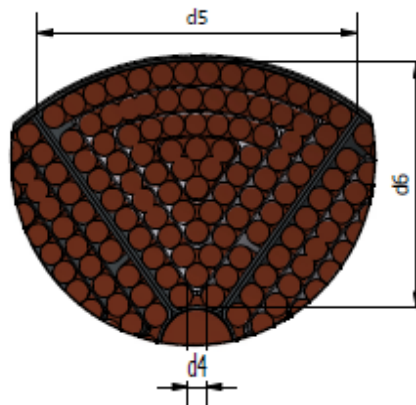
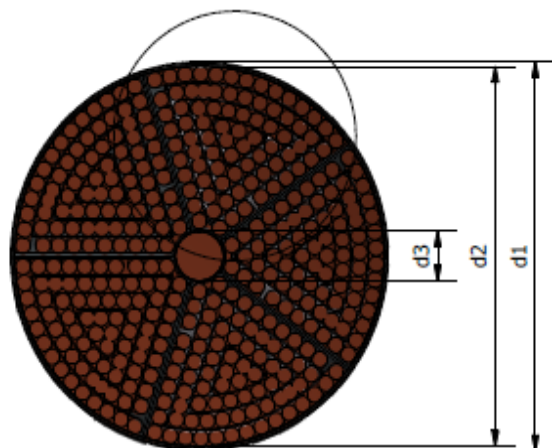


More water blocking tape
wrapped over each layer of
copper wire

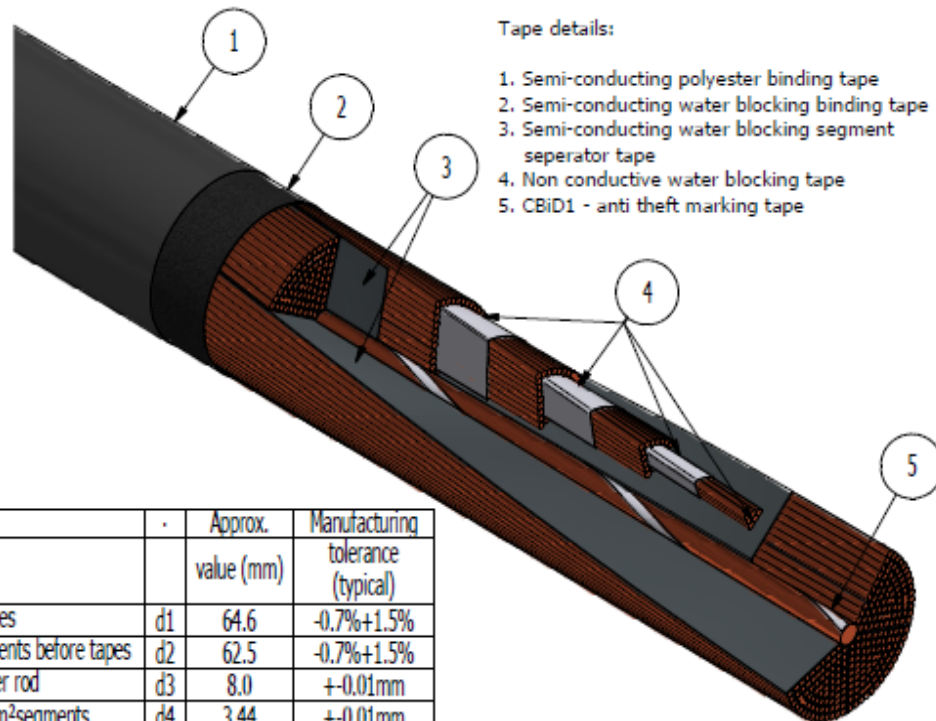
Water blocking tapes

Water blocking strings





Description		Approx. value (mm)	Manufacturing tolerance (typical)
Diameter over semi-con tapes	d1	64.6	-0.7%+1.5%
Diameter over laid-up segments before tapes	d2	62.5	-0.7%+1.5%
Diameter over central copper rod	d3	8.0	+0.01mm
Wire diameter within 500mm² segments	d4	3.44	+0.01mm
Width of 500mm² segments	d5	36.0	
Depth of 500mm² segments	d6	26.9	

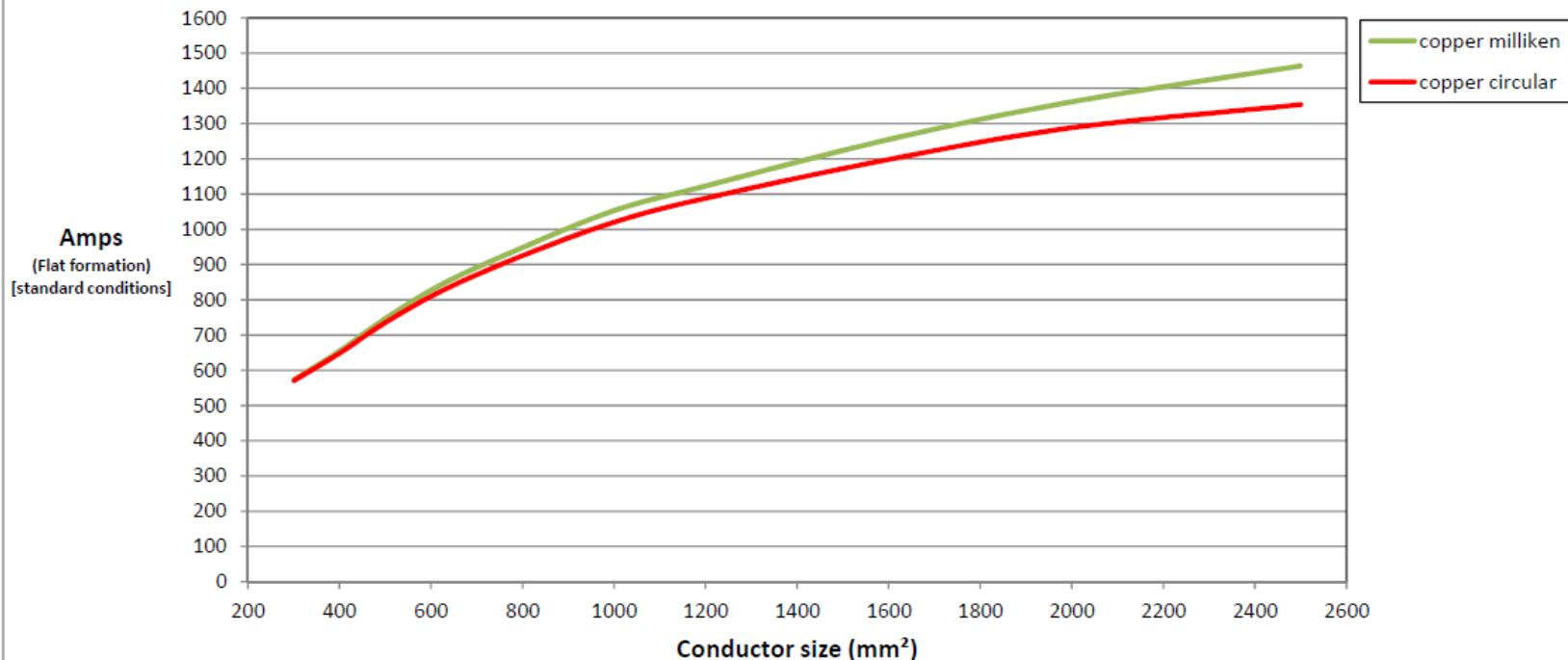


Tape details:

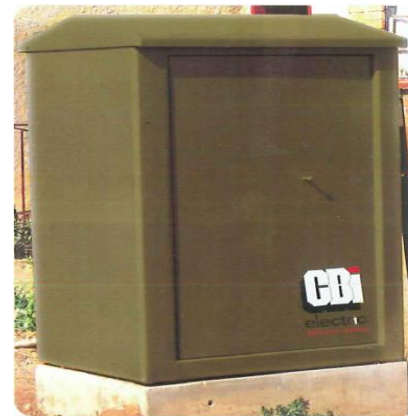
1. Semi-conducting polyester binding tape
2. Semi-conducting water blocking binding tape
3. Semi-conducting water blocking segment separator tape
4. Non conductive water blocking tape
5. CBiD1 - anti theft marking tape

Notes:

Current rating comparison for 132kV XLPE CSA cables (Circular vs Milliken Copper Conductor designs)



- Protects existing HV link boxes & fluid filled kiosks from vandalism and theft
- Features:
 - electronic locking system
 - reinforced concrete base with steel insert
 - no hinges, locks or holes on the outside
 - cannot be opened with crowbars
 - can be opened remotely from control centre
 - using GPRS technology
 - external power connection with 12V battery
 - to open doors
 - key tag with 20 digit number cannot be copied and are programmed to be area specific
 - all entries can be reported to control centre
 - heat sensors can be provided to trigger alarms
 - if an attempt is made to cut with a cutting torch



1. Cable Standards
2. Cable Terminology and Construction
3. Cable Electrical Fundamentals
4. Basics of Cable Design
5. Types of Cables
6. Cable Current Rating
7. Cable Selection
8. Factors Influencing Current Rating
9. Cable Installation Best Practices
10. After Installation Testing

