AVAILABLE EXCLUSIVELY FROM

ARB

COPPERWELD

The Most Advanced Weapon In The War To

Stop Copper Theft

Copperweld® Copper-Clad Steel

- *Magnetic*
- *Hard to cut*
- *Low scrap value*

patent pending

CAMO™

www.arb.co.za

WELL-GROUNDED CONCERNS

A primary concern of electrical engineers is reducing the chance of hazards to personnel and valuable equipment caused by dangerous voltages and high potential gradients during fault conditions. Whether at electric utility plants, telecommunications stations, military installations or in general industry, elimination of possible damage from lightning strikes or short-circuits is paramount. A reliable earthing system to dissipate the surge current to the earth is required.

Dead soft annealed (DSA) Copperweld® wire and strand have been used for over 90 years as efficient, strong, non-rusting earthing conductors. Combining the strength of its steel core with the conductivity and corrosion resistance of its copper cladding, Copperweld® earthing wire provides a long-lasting, low impedance path to earth. When annealed, Copperweld® exhibits the flexibility necessary for easy handling and is adaptable to standard installation techniques. DSA Copperweld® strand has become widely accepted as a more advantageous alternative to solid copper for earthing grids in substation and industrial installations.

Whatever the earthing application may be, there is a Copperweld® conductor available in the size, conductivity, and strength that is required. The selection of a particular size DSA Copperweld® wire or strand depends on many factors, such as short-circuit ampacity, area in contact with the earth, and temperature rise.

SAFETY FIRST

The most important step in designing a substation, transmission or distribution grid is to implement a proper earthing system. Directing surges to earth prevents contact with dangerous voltage, and protects valuable equipment, maintenance personnel or any other individual who might come in contact.

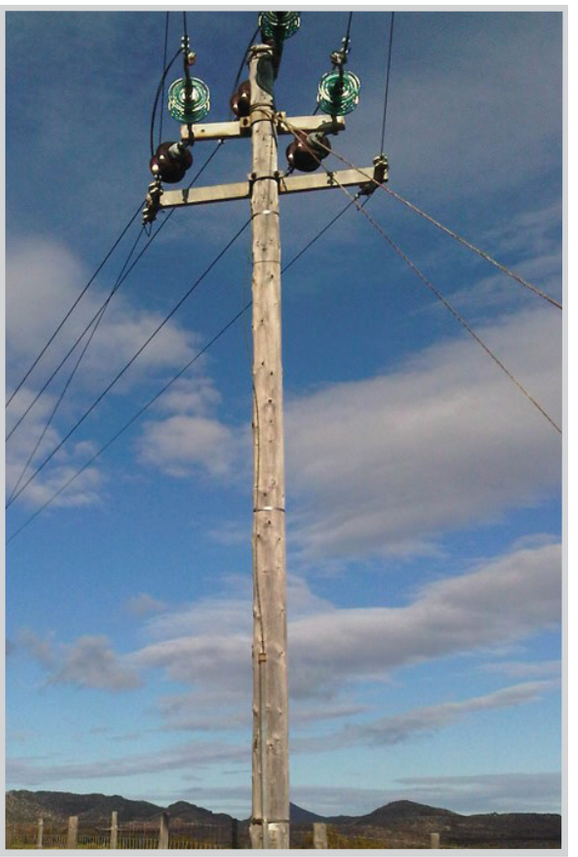
DSA Copperweld® wire and strand have the high current-carrying capacity characteristics in short-time durations, high strength properties and corrosion resistance to effectively and economically meet IEEE recommendations. These advantages are particularly evident when compared to a low-strength material such as solid copper. Solid copper conductors must be upsized in many installations to meet the mechanical demands within a system design.

Optimum earthing grid design depends on the dual complementing action of the conductor and the connected ground rods. An earthing system utilizing DSA Copperweld® strand provides efficient and economical earthing permanently.

THE NATURAL CHOICE FOR ANY APPLICATION

Substation Earthing

In substation earthing, solid copper conductor's ability to handle the maximum fault current is compromised by its low breaking strength. As a result, it is not unusual to select a larger, more costly copper conductor that far exceeds the ampacity rating needed in order to meet the design criteria for minimum breaking strength. Rugged Copperweld® conductors, with their steel core, have a breaking strength exceeding IEEE criteria.



Pole Earthing Wires

DSA Copperweld® conductors are ideal as down leads for transmission and distribution lines using wood, concrete or fiberglass poles. Their high strength, low impedance, resistance to fatigue and corrosion, and low theft potential combine to make CCS products superior for this application. Although mechanically strong, the pliability of DSA Copperweld® permits the earthing wire to be easily formed from the connection overhead, along the pole and down to the buried electrode.

Counterpoise Wire

The resistance of the tower footing or structure earthing is dependent on local soil conditions and may vary widely over the length of a transmission line. Where underlying rock prevents the driving of earthing rods to the required depth, or where sandy or rocky surface soils have high resistivity, counterpoise wires have proven very effective in improving the lightning protection afforded by the overhead earthing wires.

In selecting counterpoise material, it is particularly important to choose a conductor that is mechanically strong, resistant to corrosion, and as immune to theft as possible. At the same time, the wire should be pliable to facilitate easy handling and installation in the field. DSA Copperweld® counterpoise wire fulfills all these requirements, and provides a long-lasting, efficient and economical counterpoise earthing system.

Other Applications

Copperweld® is an excellent choice for any earthing or fault-current application, including:

- Wind Farms
- Solar Installations
- Mobile Telephony Towers

DSA COPPERWELD® STRAND FOR EARTHING APPLICATIONS: PHYSICAL AND ELECTRICAL CHARACTERISTICS

COPPER CONDUCTOR EQUIVALENCY SIZE	DIAMETER (mm)	ACTUAL CROSS-SECTION AREA (mm^2)	WEIGHT (kg/km)	APPROXIMATE SHORT-TIME FUSING CURRENT AT 1 SECOND/60 CYCLES (kA)
19-Wire Strand				
150 mm^2 EQ	20.57	252.66	2110	47.70
120 mm^2 EQ	18.33	200.47	1674	37.85
95 mm^2 EQ	16.32	158.97	1327	30.01
70 mm^2 EQ	12.94	99.97	835	18.87
7-Wire Strand				
50 mm^2 EQ	11.00	73.86	614	13.94
35 mm^2 EQ	9.36	53.49	445	10.10
16 mm^2 EQ	6.55	26.23	218	4.95

* Other stranding options and single rod solutions are available on request.

THEY DON'T STEAL STEEL

The value of solid copper makes it so appealing for thieves, it might as well be gold. Copper can be sold for big money to scrap metal dealers who don't frequently inquire as to the source of what's being turned in. Solid copper is susceptible to theft at every stage of operations whether installed, in the back of a utility vehicle or in a storehouse. Pole earthing wire and exposed copper above ground level are particularly vulnerable. Once the wire is removed or damaged, the system risks unforseen fault current, potentially harming equipment and personnel, and causing outages for the general public.

Replacing stolen copper earthing material is a costly proposition for utility companies. Copperweld® conductors are theft-resistant, as the strong steel core of our wire is difficult to cut and remove, alerting thieves that our CCS is not a solid copper conductor. There is very little scrap value, so it's not a valuable target.

Our new product, Copperweld® CAMO™ represents the next step in theft protection. By altering the appearance of the external copper layer through our patent-pending process, thieves will mistake it for simple galvanized steel,and pass it by.

BEATS COPPER IN THE GROUND

DSA Copperweld® wire and strand offers so many advantages over solid copper for earthing applications, it's the clear choice for all earthing applications.

- Conductivity of copper ...For earthing applications
- Strength of steel ...Far superior to solid copper
- Fatigue resistance ...Won't break, crack, flake or peel
- Corrosion resistance ...Long life under adverse conditions
- Ample fusing current ...Exceeds most design requirements
- Connects like copper ...Uses standard copper terminations and lugs
- Low scrap value ...Excellent theft resistance

Ask your Copperweld representative or authorized agent for samples, specifics about particular applications, or more information.

Product specifications

- ASTM B-193, ASTM B-452, ASTM B-227, ASTM B-228 and ASTM B-910 certified
- NRS 102 - Theft deterrent earthing materials
- All bimetallic products are processed at the Copperweld®'s ISO9001 and ISO14001 certified facility in Fayetteville, TN

Distributed Exclusively in
South Africa & the SADC region by:

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COPPERWELD

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