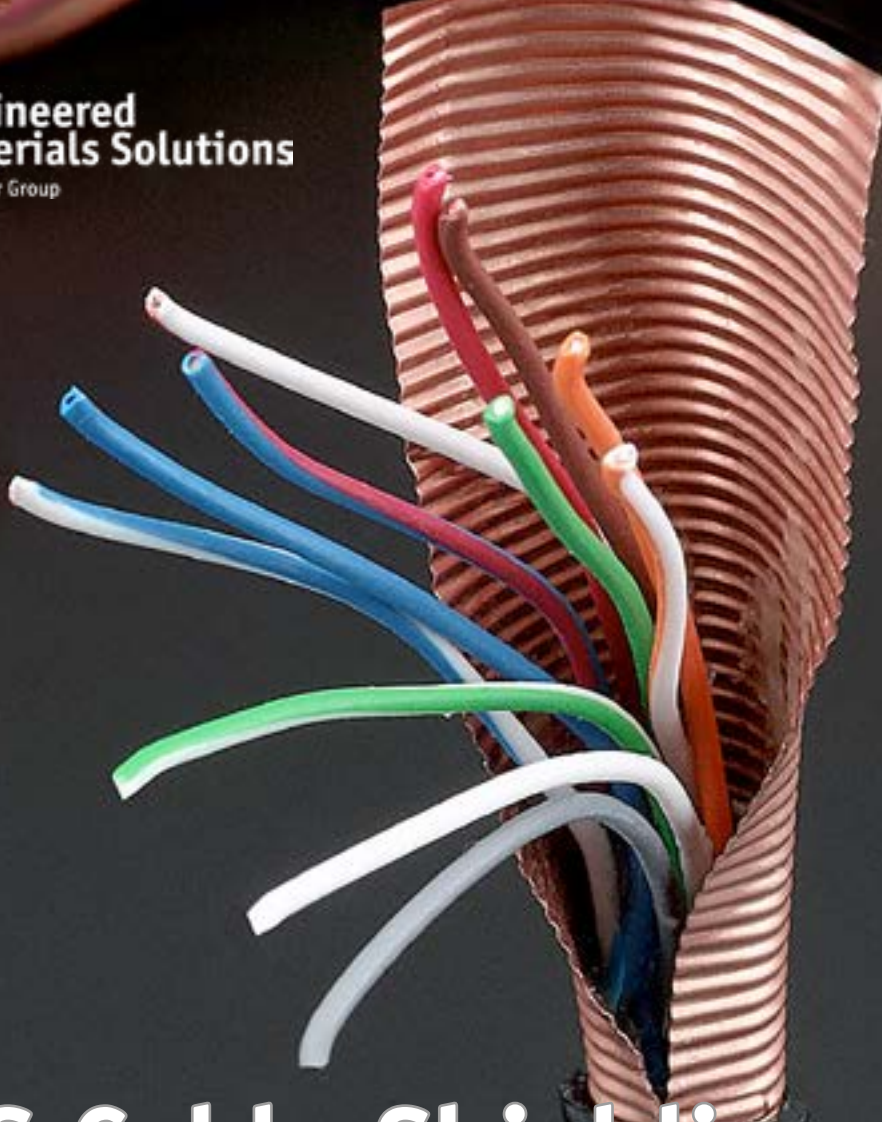




**Engineered  
Materials Solutions**  
Wickeder Group



# ACAS Cable Shielding Material

## Synergy of Two Metals

The asymmetric copper clad low carbon steel (ACAS) cable shielding material is a metallurgically bonded metallic composite produced by roll bonding. The roll-bonding process is based on solid-state welding technology, requiring no adhesive or brazing alloys to achieve a clean, permanent, bond.

Used as cable shielding strip in buried telecommunications service wire, this clad material has excellent bond integrity due to the nature of the metallurgical bond that develops between the copper and steel layers. ACAS consists of copper metallurgically bonded to both surfaces of a low carbon steel middle layer, with one copper layer being significantly thicker than the other. It combines the strength of steel with the conductivity of copper and extensive long-term corrosion testing and research has shown that copper clad steel has superior corrosion resistance properties compared with other shields within the industry.

EMS cable shielding has a long history of success in both wire and cable applications. It provides superior protection to copper twisted pair, coaxial, and fiber optic communication lines. No matter what obstacles you've faced in the past, it is possible to gain a competitive edge with clad.

## // Advantages

- › Superior mechanical strength protects cable from rodent attack
- › Highly corrosion resistant in a wide range of environments
- › Lightning protection to cable provided by copper surface
- › Conductivity shields communication line from RFI and induced surges from exterior power sources

# Physical Properties of Copper/Steel/Copper Cable Shielding

Volume Ratio: 16/68/16

Thickness: 5 Mils

Yield Strength	35-55 KSI
Tensile Strength	55-75 KSI
% Elongation in 2"	20% Minimum
Conductivity (% IACS)	28% Minimum



Cross Sectional view of ACAS

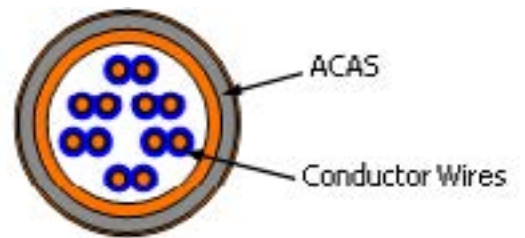
## Composite Layer Thickness

Clad strip thickness: 0.00375" +/- .0002"

Component	Layer Vol. %	Layer Thickness (nom)
Copper	5%	.0002"
Steel	55%	.0021"
Copper	40%	.0015"

Individual layers in the composite may vary by no more than plus or minus 10% of the nominal volume ratio of the thinnest component. The overall thickness tolerance must be maintained.

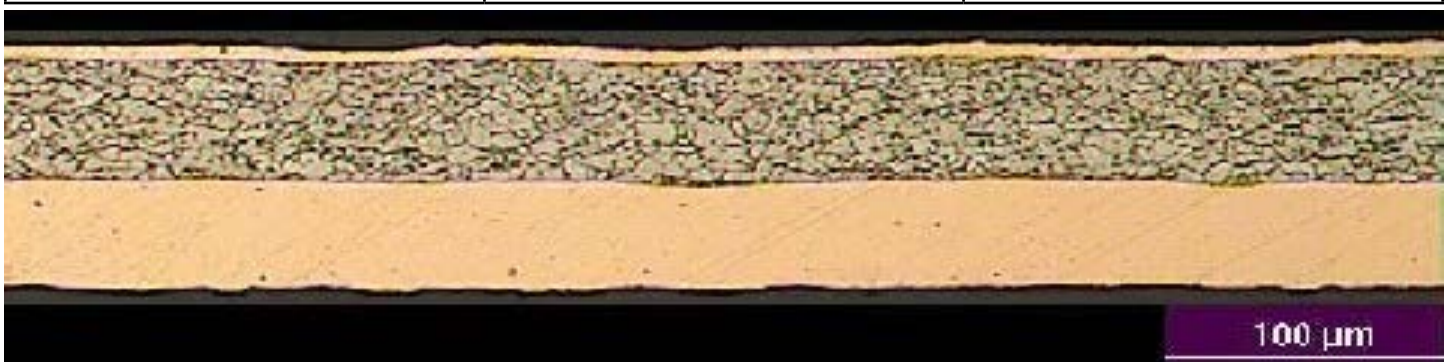
Determination of the composite layer thickness is made by cross-sectional microscopic examination. Other suitable methods of determining thickness of cladding may be used if properly standardized and related to the microscopic method.



Cross Sectional view of ACAS as wrapped around conductor wires

## Chemical Composition of Each Component

Component	Element	Weight %
Copper UNS C11000	Copper (Cu)	99.90 min
	Oxygen (O)	0.04 max
Steel UNS G10080	Carbon (C)	0.10 max
	Manganese (Mn)	0.30 - 0.50
	Phosphorous (P)	0.040 max
	Sulfur (S)	0.050 max
	Iron (Fe)	Balance



## Density

Nominal density is 0.301 lb/in<sup>3</sup>.

## Mechanical Properties

The material is expected to have the following typical tensile properties:

- Tensile Strength 35 – 50 ksi
- Elongation 10% min

## Electrical Properties

Information in this section is based on calculated values and/or limited observations. This data is supplied as design/selection criteria only and will not be certified.

- Conductivity 40 %IACS (min)

## Surface Identification

Thick copper side is marked for identification with continuous lines across the strip width. Markings are spaced no more than 12 inches apart along the strip length.

## Width

As requested up to a maximum of 17.5 inches.

## Edges

Coils supplied with a No. 3 slit edge.

## Coil Sizes

Coils supplied on 4 in ID steel sleeves. Coil OD ranges between 30 and 36 in.

## Coil Splices

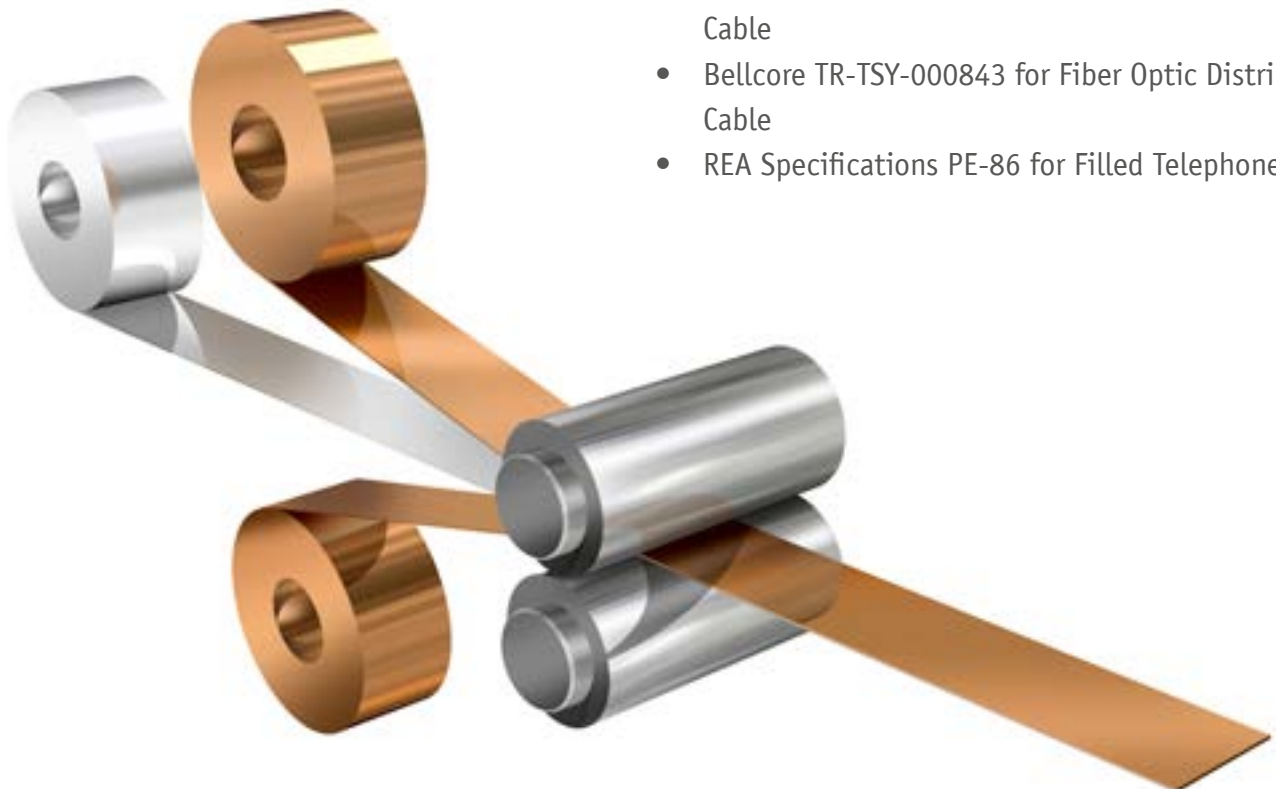
Coils can have up to 3 splices that are joined in such a way that the following parameters are met:

- Breaking strength of splice joint is not less than 80% of the breaking strength of an adjacent section of tape of equal length not containing a splice.
- Electrical resistance of a 3 ft section of shield tape containing a splice is not greater than 110% of the resistance of an adjacent section of tape of equal length not containing a splice.

## Industry Standards

EMS cable shielding conforms to the following industry standards:

- Bellcore GR-NWT-001398 for Coaxial Drop Cable
- Bellcore TA-NWT-00492 for Metallic Telecommunication Wire
- Bellcore GR-NWT-001399 for Coaxial Distribution Cable
- Bellcore TR-TSY-000843 for Fiber Optic Distribution Cable
- REA Specifications PE-86 for Filled Telephone Cable





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