

LEAD INDUSTRIES ASSOCIATION

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DEVELOPMENTS IN COMMUNICATIONS CABLES

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Two years ago, at our last meeting in Chicago, I described the accomplishments of the Western Electric Company and the Bell Telephone Laboratories in developing telephone cable using materials other than lead for sheathing. Since that time our problems of lead procurement have proved the wisdom of this action.

No doubt many of you have noticed coils of cable awaiting installation with the bright black surface which identifies the polyethylene sheath. We now have two new types of telephone cables using polyethylene sheath: "Alpeth" which consists of cable core covered with aluminum, then a thermoplastic compound over which polyethylene is extruded; and "Stalpeth" which is the same as "Alpeth" except that a steel tape is added before the polyethylene sheath. Hence the names -

"Alpeth" (aluminum - polyethylene)

"Stalpeth" (steel - aluminum - polyethylene)

It is not difficult to imagine the many problems that have confronted us in endeavoring to obtain raw materials required in the manufacture of telephone cables during the past two years when the demand for telephone service for defense and civilian requirements was, and remains, unprecedented. During this period our aim has been to produce the greatest amount of cable possible with the materials available.

Presented at the 24th Annual Meeting, Lead Industries Association, April 18-19, 1952, Chicago, Illinois.



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Many of these material shortages are now disappearing. We are all familiar with the sharp turn-around in the lead supply. The realized and expected expansion for polyethylene in the industry this year and in 1953 should make substantial additional quantities available. However, it is still under M.P.A. control. The supply of steel and aluminum also appears to be easing and all these prospects must be considered in our future planning from the standpoint of economy as well as availability of materials.

Sheathing alone, however, does not make communications cable. Copper has always been used as the conductor and it is not necessary for me to do more than mention that under present controls, the tonnage available to our industry is considerably short of what we require to satisfy the demand for cable and central office communications equipment. Although hundreds of substitutions have been made for copper in communications apparatus and equipment so that the limited supply of this metal could be used largely for cable production, nevertheless we are still far short of our needs.

Aluminum has been recognized for some time as a satisfactory conductor and early this year experimental production of aluminum conductor communications cable was started in our wire mills. Although satisfactory progress has been made, aluminum conductor is not to be considered a substitute but rather as a supplement to copper in order to provide the flexibility of having another type of cable. This will also have a bearing on the use of sheath materials. Aluminum, as you know, has a lower conductivity than copper, and to compensate for this difference it is necessary to use aluminum conductors about 25% (or two B & S gauges) larger than copper. The larger conductors increase the diameter of the cable on the average, about 20%. This greater diameter would require about 30% more lead for sheathing and would greatly increase this weight. The Alpeth or Stalpoth cables with

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aluminum conductor, therefore, appear to be the best combination from a weight standpoint.

Even after allowing for the greater diameter, these types of cable are appreciably lighter than the copper-lead combination. For example, a 202 pair aluminum conductor cable with stalpeth sheath would weigh a little more than 1/3 as much as the copper-lead cable. The advantages from a lighter weight cable in reducing shipping charges, cost of supporting structures such as pole lines and strand, and the handling effort are obvious.

We are looking forward to the day when cable raw materials will be in more balanced supply and will compete actively for their place in our manufacturing program. Then we will have the privilege of making selections based upon operating and economic advantages, thus providing far greater flexibility than we have heretofore enjoyed. The progress in the art of cable manufacture which I have briefly outlined, makes it appear that its availability and cost will determine the position lead will hold in the future of communications cable sheathing.