PLAINTIFF'S EXHIBIT
WH-841

# NETWORK CABLES



RUBBER and BRAID TYPE RS SUPERSHEATH

**General Cable Network Cables are an achievement in the development of higher standards of cable reliability. The all-rubber Supersheath* and the Braided constructions reflect many years of scientific study and experience.**

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## GENERAL CABLE

General Cable Corporation Sales Offices: ATLANTA • BOSTON • BUFFALO • CHICAGO • CINCINNATI • CLEVELAND • DA
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# LETTERS TO THE EDITOR

## Fiber Glass Compared With Asbestos

*To the Editor of* ELECTRICAL WORLD:

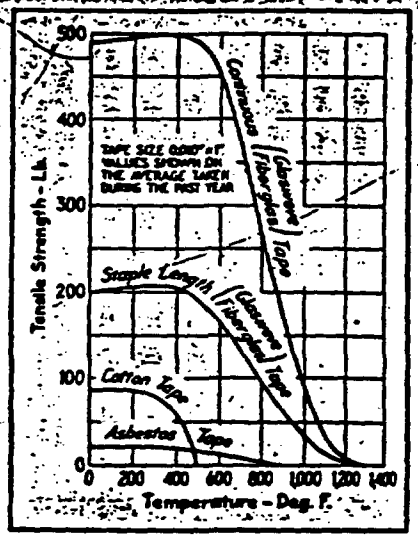
The article "Glass Fiber Enters Electrical Insulation Field" (ELECTRICAL WORLD, November 19, 1938, page 40) gives an interesting slant on glass insulation even to those of us who are familiar with the subject. It should be doubly interesting and valuable in introducing your readers to this newest insulating material.

We who have had the interesting job of incorporating glass insulation into electrical machine design and developing the technique of using it have been impressed with the significance of this development. To paraphrase an old saw, it is a case of "familiarity breeds respect." You may be interested in some of the more technical aspects of this material which we believe to be of tremendous consequence.

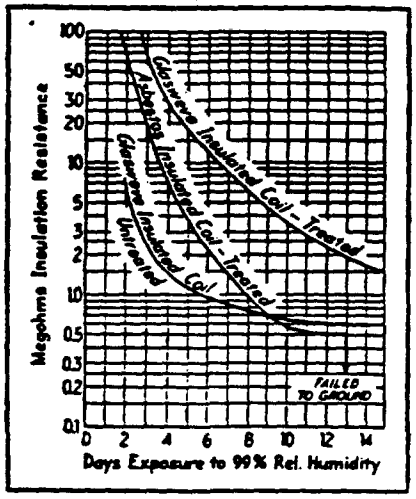
Of primary importance is the mechanical strength of glass textiles particularly after exposure to elevated temperatures. It is well known that organic materials have definite limitations in this respect. The accompanying illustration (top) tells better than words the whole story.

Glass textiles are "non-hygroscopic" as the individual fibers are almost infinitesimal glass rods and cannot absorb moisture into themselves as do other fibers. The bottom cut shows the importance of this characteristic in respect to the effect of exposure to humidity on insulation resistance. It is significant that the coil insulated with untreated glass eventually stabilizes at a higher insulation resistance than the coil insulated with treated asbestos. This is interpreted to indicate that the effect of moisture absorption by the fibers (of asbestos), even when treated, is of greater moment than the accumulation of moisture between the untreated glass fibers.

The development of glass insulation has been very rapid in recent months




1. Tensile strength of fiber glass superior at higher temperatures. Tape size 0.010 x 1 inch.




2. Effect of exposure to 99 per cent relative humidity on coils impregnated with solventless varnish as compared to no treatment.

and numerous studies are being made for its application to all fields of rotating electrical machinery and control apparatus. However, I believe that for the present it should be applied with judgment only where its advantages serve a useful purpose. In general, this covers applications where high temperature, vibration and excessive moisture conditions are encountered.

GRAHAM LEE MOSES,
Westinghouse Elec. & Mfg. Co.
East Pittsburgh, Pa.

## Amplifies Cable Formulas

*To the Editor of* ELECTRICAL WORLD:

Will you please publish the following comments on an article which I wrote, entitled "Unbalanced Currents in Parallel Cables," that appeared in the February 25, 1939, issue of the ELECTRICAL WORLD in order to clarify some apparent misunderstandings?

In connection with equation (6) it was not intended that the currents in cables $B_s$ and $B_t$ be equal, but that the derivation of the equation was on this basis. This introduces only a slight error in the result. To those readers who are interested in the value of the current in these cables the formulas are as follows:

$$B_s = I\left(\tfrac{1}{3} - j1.73\,\frac{Y - p\,(2Y - X)}{T - j87R}\right) \quad (7)$$

and $B_t = I - B_s$

in which $p$, the only new factor, is the ratio of the current in cables $A_s$ and $C_s$ from equation (6) to the total phase current $I$.

In the representative example the currents $I_s$ and $I_{ss}$ which were given as 500 + j0, were not intended to be the currents in cables $B_s$ and $B_{ss}$ but merely a reference for the currents in the other cables in order to show the unbalance. The value of these currents would be:

$$B_s = 569 - j157 = 591$$
$$\text{and } B_t = 431 + j157 = 459$$

These currents as well as those given in the article are all referred to the same axis rather than to their three-phase axes. This shows the unbalance of currents more readily.

ROBERT M. SENSINTAFFAR,
Denver, Colo.