

(d) The relation between dielectric loss angle and frequency varies with the kind and percentage of catalyser, molding temperature, etc. At radio frequency its max. value is 0.0060 and min. value 0.0020. By heating after molding, loss angle becomes smaller.

(e) The relations between mechanical strain and temperature under a constant load were measured. These results show that we can use them at 250°C. The tensile strength, however, is a little smaller.

So we are now studying to get stronger tensile strength. At the same time we are trying to make the silicone resin laminated products, because it is an evident fact that laminated one has stronger tensile strength than molded one on account of their construction.

27. Studies on Silicone Resins. (VI)

On the Silicone Resin Coated Wire.

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(A) The mechanical properties of our silicone resin coated wire which was reported in last year report were not satisfactory. Since then, we have been studying to get better results.

The silicone resins, monomer or a little condensed, are previously heated at lower temperature than that for curing resins on wire, and diluted by solvents so that they are convenient to coat on wire.

By this first treatment the order of poly-condensation of the silicone resin film on wire would become larger, and, on the other hand, the vaporizing water at curing would decrease. From these reasons we expected that the mechanical properties would be improved, pin-holes would not grow and the curing time would become much shorter. These ideas were proved by our experiments. For instance, hitherto, the silicone resin coated wire which was cured over about 140°C had many pin-holes, so we had to cure it under 140°C. By above mentioned treatment, however, we can now cure it at 220°C without pin-holes with less curing time within 30 sec. with the mechanical properties which passes JES standard.

(B) The adhering strength of the silicone resin to copper and aluminum plate was studied. The results are as follows.

(a) The adhering strength to oxidized copper is larger than that to non-oxidized copper. This may be due to the reason that resins have mechanical anchor ground in rough film of oxidized copper.

(b) The adhering strength to aluminum plate is smaller than that to copper.

(c) The silicone resins show about five times adhering strength compared to W-41 varnish which are generally used for enameled wire.